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In cooperation with Illinois
Agricultural Experiment
Station

Soil Survey of Lake County, Illinois

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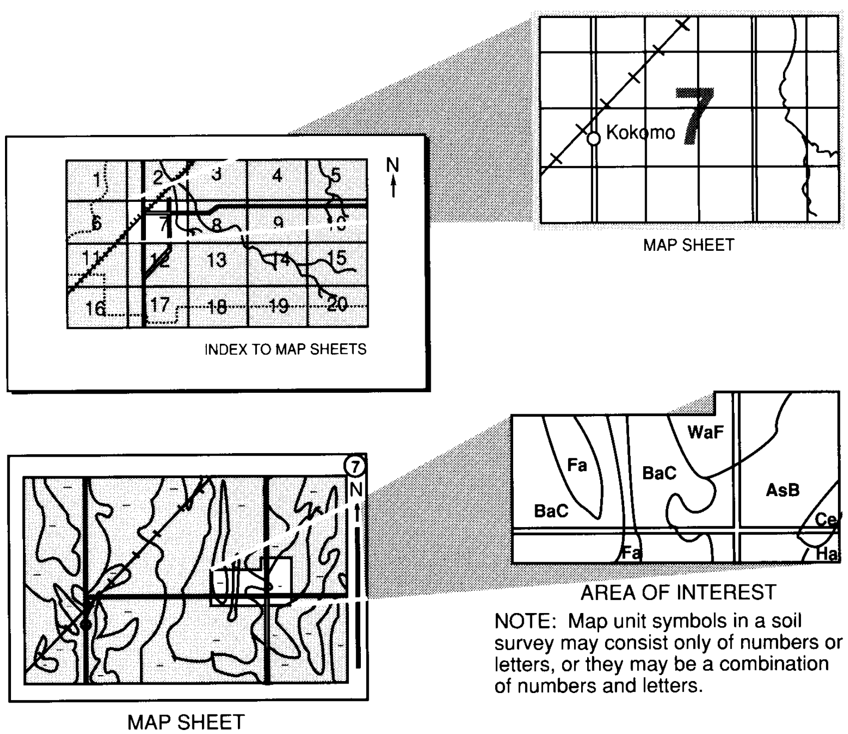
How To Use This Soil Survey

This publication consists of a manuscript and a set of soil maps. The information provided can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described. The map symbols and names also appear as bookmarks, which link directly to the appropriate page in the publication.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Lake County Soil and Water Conservation District. Financial assistance was made available by the Lake County Board and the Illinois Department of Agriculture.

Major fieldwork for this soil survey was completed in 2002. Soil names and descriptions were approved in 2003. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2002. The most current official data are available on the Internet.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover Photo Caption

The landscape in Lake County is a mosaic of residential and commercial development, farmland, wetlands, forestland, and natural and constructed bodies of water. Pictured are Third Lake and Druce Lake, which are of glacial origin. These lakes provide numerous recreational opportunities.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Issued June 2005

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Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

Soil surveys are designed for many different users. Farmers, foresters, and agronomists can use the surveys to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the surveys to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the surveys to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Lake County, Illinois

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Illinois Agricultural Experiment Station

LAKE COUNTY is in the northeast corner of Illinois (fig. 1). It has an area of 301,435 acres, or about 471 square miles, and is divided into 18 townships. In 2000, the population was more than 644,000 (U.S. Department of Commerce, 2000). Waukegan is the county seat and largest city. The county is bordered by Cook County on the south, by McHenry County on the west, by Kenosha County, Wisconsin, on the north, and by Lake Michigan on the east.

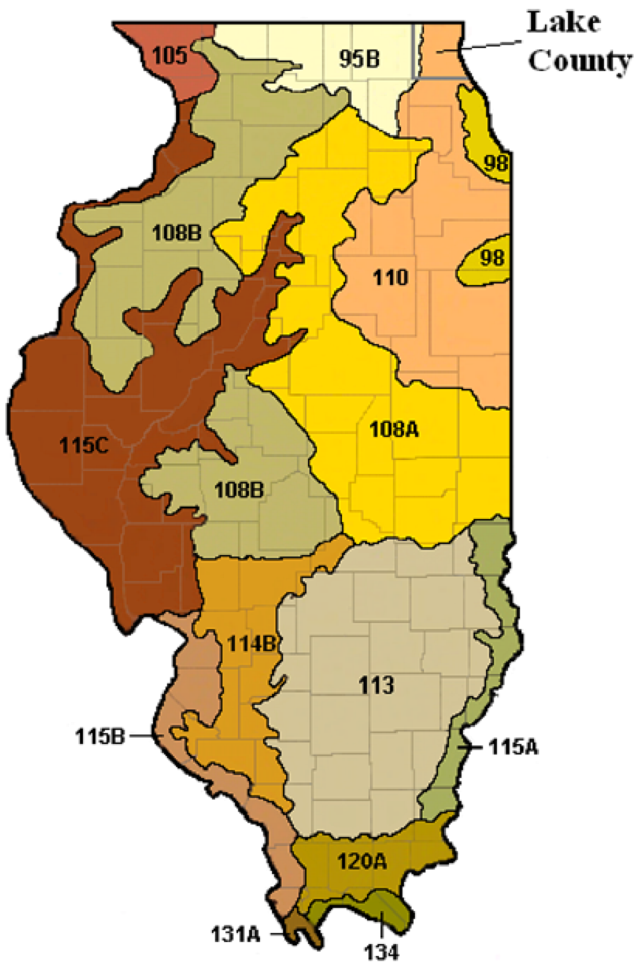
This survey area is a subset of Major Land Resource Area (MLRA) 95B, the Southern Wisconsin and Northern Illinois Drift Plain, and MLRA 110, the Northern Illinois and Indiana Heavy Till Plain (USDA, 1981).

This survey updates the survey of Lake County published in 1970 (Paschke and Alexander, 1970). The original soil survey was one of the first modern soil surveys intensively used in urban planning. The updated survey provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

The GIS Division of the Lake County Department of Information and Technology, the Lakes Management Unit of the Lake County Health Department, and the Planning, Conservation, and Development Department of the Lake County Forest Preserve District helped prepare this section.

This section provides general information about Lake County. It describes history and development; physiography, relief, and drainage; natural resources; urbanization; transportation facilities; industry; agriculture; and climate.



LEGEND

95B—Southern Wisconsin and Northern Illinois Drift Plain
98—Southern Michigan and Northern Indiana Drift Plain
105—Northern Mississippi Valley Loess Hills
108A and 108B—Illinois and Iowa Deep Loess and Drift
110—Northern Illinois and Indiana Heavy Till Plain
113—Central Claypan Area
114B—Southern Illinois and Indiana Thin Loess and Till Plain
115A, 115B, and 115C—Central Mississippi Valley Wooded Slopes
120A—Kentucky and Indiana Sandstone and Shale Hills and Valleys
131A—Southern Mississippi Valley Alluvium
134—Southern Mississippi Valley Silty Uplands

Figure 1.—Location of Lake County and major land resource areas (MLRAs) in Illinois.

History and Development

Native Americans of the Illinois Potawatomi Tribe originally inhabited the area now known as Lake County as early as 1720. In 1833, by way of treaty, the Potawatomi Indians turned the land over to the U.S. Government. In 1834, the first permanent European settler, Captain Daniel Wright, made his home in Indian Creek, which was later renamed Half Day. Many settlers arrived in the area shortly thereafter and established settlements throughout the county.

Formerly, the northeast corner of Illinois was known as McHenry County. In March 1839, the Illinois State Legislature officially established a portion of this area as Lake County. The county seat was originally located in Libertyville, known then as Independence Grove. In 1841, the settlers voted to move the county seat to Little Fort, now Waukegan, where it remains today.

Physiography, Relief, and Drainage

Lake County consists of moraines, outwash plains, lake plains, kames, stream terraces, flood plains, beaches, and bogs. The county is in the Wheaton Morainal country of the Great Lakes section of the Central Lowland province (Leighton and others, 1948). Relief in Lake County was caused by differences in the thickness of deposits left by the most recent glacier. Generally, the land surface elevation is highest in the northwestern part of the county. The land surface gradually slopes to the south or southeast. The highest point in the county, 957 feet above mean sea level, is located on Gander Mountain in the northwest corner. The lowest point is 580 feet above mean sea level at the Lake Michigan shore near Waukegan (fig. 2).

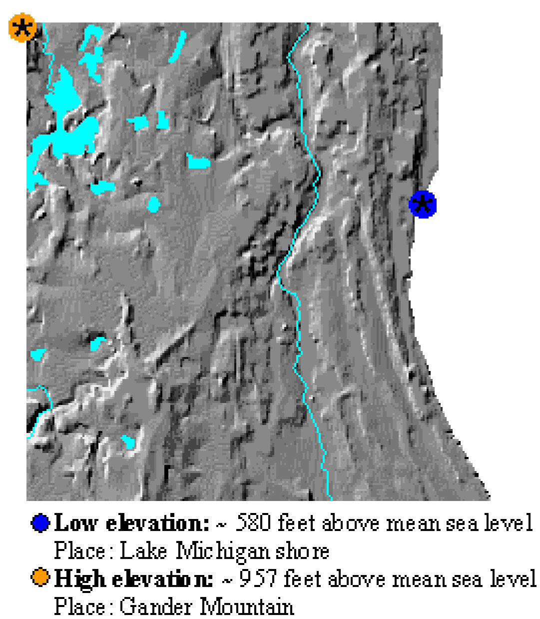


Figure 2.—A generalized relief map of Lake County.

Several moraines run through the county. From east to west, they are the Lake Border Morainic System, the Tinley Moraine, the Valparaiso Morainic System, and the Fox Lake Moraine (Hansel and Johnson, 1996).

In general, Lake County has a poorly defined drainage pattern. Many drainageways terminate in depressions and marshes. The land area falls into four major watersheds and 26 drainage basins. The Chicago River, Des Plaines River, Fox River, and Lake Michigan watersheds are all shared with neighboring counties in Illinois and Wisconsin.

Natural Resources

The Government Land Office maps and field notes from the 1830s portray the survey area as very sparsely settled, a mixture of forested areas and prairie with extensive wetlands. A study by the Illinois Natural History Survey (Suloway and Hubbell, 1994) estimates that 40 to 61 percent of the county was wetlands. This estimate is based on the large number of hydric soils mapped in the survey area. The word “Lake” in the county’s name was very appropriate; even after 160 years of settlement and development, that same study estimated that 6 to 15 percent of the county’s original wetlands remained. The Lake County Health Department has inventoried more than 250 lakes with an area of 6 or more acres (fig. 3). The Lake County Wetland Inventory, a cooperative project of Federal and local agencies, has mapped over 8,700 wetland areas. An Advanced Identification Study (ADID) initiated by the U.S. Environmental Protection Agency and published in 1992 (U.S. Environmental Protection Agency, 1992) listed 203 high-quality wetland sites and commented that “The diverse ecosystems within wetlands offer necessary habitat for wildlife and plant communities, including many threatened and endangered species. Wetlands in the county are critical in controlling flooding, and in protecting hydrologic cycle functions such as groundwater recharge, flow attenuation, and maintenance of baseflows.”

Figure 3.—Grass Lake is one of a number of lakes making up the Chain O’Lakes in northwestern Lake County.

A large geographic area in the county receives drinking water from Lake Michigan. Communities primarily in the far western part of the county rely on municipal and private wells for water. The ground-water supply is available from aquifer systems. These systems include bedrock aquifers and glacial drift aquifers (Stoffel and Larson, 1976). The bedrock aquifers consist of deep sandstone and shallow dolomite. The glacial drift aquifers are both surficial and buried. They consist of sand and gravel deposits. There is concern about the impact of ongoing development in Lake County and surrounding areas on both deep and shallow aquifers, since the likelihood of increasing the water allocation from Lake Michigan seems small (Northeastern Illinois Planning Commission, 2001). A major study by the Great Lakes Coalition, a consortium of the U.S. Geological Survey, the Illinois State Geological Survey, and several other Great Lakes states, is now underway to provide accurate geological mapping and assessment of aquifers; however, it will take many years to complete that study.

For many years, Lake County has been one of the major producers of sand and gravel in the State. The importance of sand and gravel deposits as mineral resources depends on the thickness and extent of the deposit, mineralogy, accessibility, and the amount of overburden. Economically valuable sand and gravel deposits occur in the Des Plaines River Valley. The material generally has less than 10 feet of overburden, is clean, and is at least 20 feet thick (Stoffel and Larson, 1976). Commercial sand and gravel are also being mined from kames and outwash plains in the western part of the county. These deposits, however, are more variable in texture and thickness than those in the Des Plaines River Valley. Peat and muck also are excavated for commercial use.

With the strong support of voters, the county Forest Preserve District has expanded forest preserve land holdings and is now able to protect and/or restore a significant number of natural resource areas. There are several State parks in the county, including the Illinois Beach Park, which encompasses a rare beach-dune landscape not found elsewhere in Illinois. The ravines in the bluffs overlooking the shore of Lake Michigan are another unusual landscape feature. The county has more than 35 nature preserve sites (designated by the Illinois Department of Natural Resources) and more than 65 Natural Area Inventory sites. The Illinois Department of Natural Resources has identified 147 threatened or endangered animal species and 331 threatened or endangered plant species in the county (Illinois Department of Natural Resources, 1999).

Urbanization

Lake County was created by the Illinois State Legislature in 1839. In 1900, the population was only 34,504. A number of other counties in Illinois had a higher population. Although located directly north of Chicago and Cook County, which already had nearly 2 million residents by 1900, the suburban land use that is dominant today did not occur until after World War II. Atlases published around 1900 show large farm parcels; small towns were mainly along the shores of Lake Michigan. Although the population had doubled by 1920, major growth began after the 1940s; the population was 179,097 in 1950. The 2000 census (U.S. Department of Commerce, 2000) counted 644,356 residents, most of whom are concentrated within the county's more than 50 municipalities. Several forecasts project a population of more than 800,000 by 2010. The population has become more racially and ethnically diverse over the years.

The county is a generally prosperous area with a median income higher than that in the rest of the State. Farms and other open spaces have been disappearing rapidly and have been replaced by residential and commercial development (fig. 4). In 2001, agriculture accounted for approximately 600 jobs in the county, contrasted with total

Figure 4.—Land use changes in Lake County continue as the population grows. (Photograph by Michael Sands)

private sector employment of more than 305,000 (American Farmland Trust, 2001). Growth has brought challenges to local government agencies, including flooding problems, the preservation of natural resources, congested roads, and the need to expand schools and infrastructure. As the agricultural land use in Lake County has declined, the soil survey is increasingly used for more environmentally oriented urban applications.

Transportation Facilities

Lake County has a well developed, multi-modal transportation system. The county is served by Interstate Highway 94; U.S. Highways 12, 14, 41, and 45; and Illinois State Highways 21, 22, 43, 53, 59, 60, 83, 120, 131, 132, 134, 137, 173, and 176. Lake County also has a well integrated highway system consisting of county, township, and municipally maintained roads. An extensive and growing path system, constructed and maintained by the Lake County Division of Transportation, the Forest Preserve District, and numerous local governments, provides access for bikes and hiking throughout the area and intersects with and complements the road network.

Lake County residents have easy access to two international airports: Chicago's O'Hare International Airport and Milwaukee's General Mitchell Field. There are two general aviation airports within the county: Waukegan Regional Airport and Campbell Airport. Waukegan Regional Airport is used extensively for corporate air travel.

Four major passenger rail lines serve commuters. Several major railroad companies also serve the area. Expansion of passenger service is planned in the growing areas in the western part of the county. The county also has a public bus system.

Traffic congestion related to population growth has been identified as a major and growing problem in some parts of the county, as it is throughout the urbanized northeastern area of the State. Many agencies are working to find solutions.

Industry

The U.S. Bureau of the Census reported 305,529 employees in Lake County in 1999. The sectors with the greatest number of employees included manufacturing (19 percent), retail trade (14 percent), health care and social assistance (9 percent), finance and insurance (7 percent), and professional, scientific, and technical services (6 percent).

The county hosts the Great Lakes Naval Training Center, the national center for Navy recruit training. Some 50,000 recruits graduate each year. Several major pharmaceutical companies are headquartered in the county, which is also home to numerous other corporate facilities.

Lake County ranked third overall in the State in total tourism expenditures, employing 10,000 persons in this industry. The venues attracting the largest number of visitors include the Gurnee Mills shopping center, Six Flags Great America, and Illinois Beach State Park. Gurnee Mills attracts 23 million visitors per year. The Ravinia Festival, the summer home of the Chicago Symphony Orchestra, draws audiences from a wide area. Recreational opportunities abound, including 37 public golf courses. In an average year, 2.5 million people visit the Lake County forest preserves.

Agriculture

In the past, farming was an important enterprise in Lake County. Between 1992 and 1997, however, 22,241 acres was taken out of production, and the downward trend continues (U.S. Department of Commerce, 1997). In 1997, 50,901 acres was used for agricultural production. The number of farms was 335, and the average farm size was 152 acres. Corn was grown on 13,827 acres, soybeans on 13,987 acres, wheat on 4,363 acres, and hay on 3,913 acres. In 1997, the number of livestock in Lake County totaled 1,648 head of cattle, 349 hogs, and 505 head of sheep. The market value of agricultural products sold exceeded $32 million, and the value of crops, including nursery and greenhouse crops, accounted for 87 percent of that total (fig. 5).

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Waukegan in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 23.9 degrees F and the average daily minimum temperature is 15.9 degrees. The lowest temperature on record, which occurred at Waukegan on January 19, 1985, was -27 degrees. In summer, the average temperature is 69.1 degrees and the average daily maximum temperature is 79.1 degrees. The highest temperature, which occurred at Waukegan on July 14, 1995, was 102 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is 34.36 inches. Of this total, about 20.57 inches, or 60 percent, usually falls in May through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.00 inches at Waukegan on June 20, 1972. Thunderstorms occur on about 38 days each year, and most occur between April and September.

Figure 5.—As the population continues to grow in the county, the demand for nursery crops also increases.

The average seasonal snowfall is 37.4 inches. The greatest snow depth at any one time during the period of record was 32 inches recorded on January 14, 1979. On an average, 27 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 18.0 inches recorded on January 3, 1999.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 83 percent. The sun shines 67 percent of the time possible in summer and 46 percent in winter. The prevailing wind is from the south. Average windspeed is highest, between 11 and 12 miles per hour, from November to April.

How This Survey Was Made

Soil surveys are updated as part of maintenance projects that are conducted for a major land resource area (MLRA) or other region. Maintaining and coordinating soil survey information within a broad area result in uniformly delineated and joined soil maps and in coordinated interpretations and map unit descriptions for areas that have similar physiography, climate, and land use.

Updated soil survey information is coordinated within the major land resource area or other region and meets the standards established and defined in the memorandum of understanding. Soil surveys that are consistent and uniform within a broad area enable the coordination of soil management recommendations and a uniform program application of soil information.

This survey was made to provide updated information about the soils and miscellaneous areas in the survey area, which is a subset of MLRA 95B and MLRA 110 (fig. 1). Major land resource areas are geographically associated land resource units that share a common land use, elevation, topography, climate, water, soils, and vegetation. Map unit design and the detailed soil descriptions are based on the occurrence of each soil throughout the MLRA.

The information in the survey includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses.

Soil scientists observed the steepness, length, and shape of the slopes; the degree of erosion; the general pattern of drainage; and the kinds of crops and native plants. They made borings and dug holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landform merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries. After soil scientists located and identified the significant natural bodies of soil in the survey area, they then drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit.

Fieldwork in the Lake County soil survey update consisted primarily of soil transects conducted by soil scientists. Soil transects are a systematic way of sampling a specific soil type. Soil borings are taken at regular intervals. Soil scientists then record the characteristics of the soil profiles that they study. They note soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. This information can also be used to run statistical analyses for specific soil properties. These results, along with other observations, enable the soil scientists to assign the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

The soil maps from the 1970 published survey were originally digitized by the GIS Division of the Lake County Department of Information and Technology during the period from 1988 to 1990. This process produced one of the Nation's first digital soil surveys. Starting in 2002, these soil vector lines were then adjusted on the computer by soil scientists working on the update survey. U.S. Geological Survey digital aerial black and white orthophotography taken in 1998-99 and Lake County GIS Division digital black and white and color-infrared orthophotography taken in 2000 were used as base maps. Soil scientists studied the orthophotographs, U.S. Geological Survey topographic maps, and digital 2-foot contour maps (provided by the Lake County GIS Division) to relate land and image features. Adjustments of soil boundary lines on the digital soil maps were made to coincide with the tonal patterns on the orthophotographs and topographic map contour lines. The orthophotographs also show trees, buildings, fields, roads, lakes, and rivers, all of which help in locating soil boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area may not fully agree with those of the soils in adjacent survey areas. Differences are the result of an improved knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

Formation of the Soils

Soil forms through processes that act on deposited geologic material. The five major factors of soil formation are the physical and mineralogical composition of the parent material; the climate in which the soil formed; the plant and animal life on and in the soil; the relief; and the length of time the processes of soil formation have acted on the parent material (Jenny, 1941).

Climate and plant and animal life are the dominant active factors of soil formation. They act directly on the parent material, either in place or after being moved from place to place by water, wind, or glaciers, slowly changing it into a natural body that has genetically related horizons. Relief modifies soil formation and can inhibit soil formation on the steeper, eroded slopes and in wet, depressional or nearly level areas by controlling the moisture status of soils. Finally, time is needed for changing the parent material into a soil that has differentiated horizons.

The factors of soil formation are so closely interrelated and conditioned by each other that few generalizations can be made regarding the effects of any one factor unless the effects of the other factors are understood.

Parent Material

Parent material is the unconsolidated geologic formations from which soils develop. The soils of Lake County were derived from parent materials that were directly or indirectly impacted by Illinoian and Wisconsinan glaciation. The parent materials in Lake County include till, outwash, lacustrine deposits, loess (or silty material), organic deposits, alluvium, and beach deposits.

Parent materials were distributed by the action of ice, water, and wind. During the glacial epoch, several glaciers advanced across the region now occupied by Lake County. These glaciers consisted of the Valparaiso and Lake Border Morainic Systems and the Tinley Moraine. They not only removed old soils, but they also deposited large amounts of freshly ground-up rock materials, in which our present-day soils formed.

Till makes up the largest proportion of the glacial deposits covering Lake County. Till consists of unsorted ice-deposited sediment composed of a matrix of silt, clay, and sand, in which pebbles, cobbles, and boulders are embedded. The till in Lake County is the Wadsworth Formation of the Wedron Group (Hansel and Johnson, 1996). It is a fine textured till. In its unaltered state, it is gray; when oxidized, it ranges from yellow to olive brown. Elliott and Beecher soils formed in this material.

Outwash was deposited by moving water in front of the melting ice sheets. The particle size of the material that was deposited depended on the speed of the water flow. As the water velocity slowed, the larger particles were initially deposited. The velocity continued to slow over a larger distance, and the smaller particles were deposited. Layers of deposition are readily apparent within very short vertical distances but are less obvious within horizontal distances. The outwash deposits in

Lake County are loamy or consist of a mixture of sand and gravel. They are generally friable. They are part of the Henry Formation of the Mason Group (Hansel and Johnson, 1996). Casco and Fox soils formed in loamy outwash over sandy and gravelly deposits.

Lacustrine material was deposited in the relatively still water of glacial lakes. After the coarser fragments were deposited as outwash by moving water, the finer particles, such as very fine sand, silt, and clay, settled in still water. Vertical variation is greater than horizontal variation. The layers in this material are commonly thicker than those in outwash. The fine textured lacustrine deposits are part of the Equality Formation of the Mason Group (Hansel and Johnson, 1996). Del Rey and Martinton soils formed on glacial lake plains.

Sometime after the glaciers retreated, conditions became drier and the winds increased. A layer of silty material, or loess, was deposited over the area directly by the winds. The primary sources of the loess were the flood plains along major rivers. Some of the silty material in the county may be of local origin since it contains more sand than is typical for loess. Loess covers the till, outwash, and lacustrine material throughout most of the county. It is generally uniform within vertical and horizontal distances. It is less than 40 inches in thickness throughout the county. The upper part of the profile of Mundelein and Zurich soils formed in loess.

Organic deposits consist of decomposed plant remnants. After the glaciers receded, water was left standing in depressions. As a result, these areas were very wet during soil formation, and the decaying plant material accumulated more quickly than it decomposed. Most of these plant remains are decomposed to a point that they are unrecognizable. These organic deposits are called sapric material. They are probably more abundant in Lake County than in any other area in Illinois. In Lake County these deposits occur in three different geologic environments: in the Chain O'Lakes lowland of the Fox River, between the various morainic ridges, and in the sandy area behind the present Lake Michigan beach ridge. Adrian and Houghton soils are examples of soils that formed in these deposits.

Alluvium consists of material and sediments deposited by streams and rivers on flood plains. The texture of alluvium varies, depending on the velocity of the water source and the texture of the sediment in the water. Sawmill soils formed in silty alluvium.

Beach ridges and beach terraces are features making up the past stages of a once larger Lake Michigan. Udipsamments formed in beach deposits.

Climate

Lake County has a temperate, humid continental climate. The general climate has had an important overall influence on the characteristics of the soils. However, the climate is essentially uniform throughout the county and has not caused any major differences among the soils. Climate has very important effects on weathering, vegetation, and erosion.

The weathering of minerals in the soil increases as temperature and rainfall increase. Most years, this region has enough rainfall and melted snowfall to moisten all of the soil and underlying materials to the level of the permanent water table. The degree of saturation is variable, depending on thickness and permeability of unconsolidated materials, their water-holding capacity, and topography. In general, rainfall either percolates downward to underground outlets, evaporates, is transpired by plants, or moves across the land surface to streams, carrying with it material in solution and suspension. As water moves downward, clay is moved from the surface soil to the subsoil, where it accumulates. Salts of calcium, magnesium, potassium, and other bases, as well as various organic and inorganic colloids, also are formed. Some accumulate where formed, some are carried away in drainage waters, some are moved to other parts of the soil profile to help form soil horizons, and some are taken up by plants in the form of nutrients. The latter tend to be returned to the local soil area unless removed by animals or humans. Freezing and thawing help to break down rock fragments to smaller and smaller particles, and the action of sun and wind influences many phases of plant and animal life. The climate in Lake County has generally favored prairie grasses and hardwood forests. Spring rains and wind can cause extensive erosion in areas where crop residue, trees, and other vegetative cover have been removed from the surface. More soil will be lost through erosion each year than is formed by natural processes.

Living Organisms

Soils are affected by the vegetation under which they formed. The main contribution of the vegetation and biological processes is the addition of organic matter and nitrogen to the soil. The amount of organic material in the soil depends on the kind of native plants that grew on the soil. Two kinds, tall-grass prairie and deciduous forest, were present when Lake County was settled and presumably had been there for a long time. Grasses have many fine fibrous roots that add large amounts of organic material to the soil when they die and decay. Soils that formed under prairie vegetation, therefore, have a thick, black or dark brown surface layer. In contrast, soils that supported native vegetation of deciduous trees have a thinner, lighter colored surface layer. Forest debris accumulated primarily on the soil surface, where most of it decayed rapidly or was burned or eroded away. A relatively small amount was carried by soil organisms into the upper 1 to 5 inches of mineral soil, where it was partially preserved. In the virgin or uncultivated state, soils that developed under both types of vegetation have a dark surface layer resulting from an accumulation of organic matter. However, the dark layer is much thicker in prairie soils, typically ranging between 10 and 18 inches. Examples of soils that developed under prairie conditions are Barrington and Elliott soils. In soils that formed under forest vegetation, the surface layer is generally 3 to 6 inches thick. Examples of soils that formed under forest vegetation are Ozaukee and Zurich soils. Where the two types of vegetation were combined or where forest was encroaching on prairie, the surface layer is 7 to 10 inches thick. Examples of soils that formed in these transitional areas are Markham and Grays soils. Mucky soils commonly have an accumulation of herbaceous organic material several feet deep. Houghton muck is an example.

Bacteria, fungi, and other micro-organisms help to break down the organic material and thus provide nutrients for plants and other soil organisms. The stability of soil aggregates, which are structure units made up of sand, silt, and clay, is affected by microbial activity because cellular excretions from these organisms help to bind soil particles together. Stable aggregates help to maintain soil porosity and promote favorable relationships among soil, water, and air. Moreover, earthworms, crayfish, insects, and burrowing animals tend to incorporate organic material into the soil and to keep soils open and porous.

Human activities also are important factors in soil formation and development in Lake County. Settlers first cleared the native vegetation and plowed the land. By cultivating slopes, the farmers left the soils vulnerable to erosion and deposition. Later, when plant nutrients were depleted in the soil, fertilizer and lime were applied. Urban and industrial expansion over the past several decades also has resulted in a significant amount of land being drained, cleared, excavated, and filled. These practices have had a pronounced effect on past soil formation and on present and future soil development.

Topography

Relief, which includes elevation, topography, and water table levels, largely determines the natural drainage of soils. In Lake County the slopes range from 0 to 30 percent. Natural soil drainage ranges from excessively drained on the backslopes and summits to very poorly drained in depressions.

Relief affects the depth to the seasonal high water table or natural drainage of the soil by influencing infiltration and runoff rates. The poorly drained Ashkum and Pella soils occur in low, nearly level areas and have a water table close to the surface for most of the year. The soil pores contain water, which restricts the circulation of air in the soil. Under these conditions, iron and manganese compounds are chemically reduced. As a result, the subsoil is dull gray and mottled. In the more sloping, well drained Dresden and Fox soils, the water table is lower and some of the rainfall runs off the surface. The iron and manganese compounds are well oxidized. As a result, the subsoil has brown colors. Between these extremes, or in areas where the water table fluctuates slowly into and out of the soil profile, the compounds are moderately well oxidized to imperfectly oxidized and result in mixed or mottled colors.

Local relief also influences the severity of erosion. Even though some erosion occurs on all sloping soils, the hazard of erosion generally is more severe as the slope increases. The runoff and the removal of soil material on these slopes result in the formation of soils that have a relatively thin solum.

Time

The length of time needed for the formation of a soil depends on the other factors of soil formation. Soils form more rapidly and are more acid if the parent material is low in lime content. Thus, more rapidly permeable soils form more readily than more slowly permeable soils because lime and other soluble minerals are leached more quickly. Forest soils form more quickly than prairie soils because grasses are more efficient in recycling calcium and other bases from the subsoil to the surface layer. Soils in humid climates that support good growth of vegetation form more rapidly than those in dry climates.

The length of time that the parent materials have been in place determines, to a great extent, the degree of profile development. Most of the soils in Lake County began formation with the retreat of the last glacier about 12,500 years ago. On flood plains, however, material is deposited during each flood. This continual deposition slows development. Sawmill soils are examples of this process.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 4 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *oll*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquoll (*Aqu,* meaning water, plus *oll,* from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Endoaquolls (*Endo,* meaning within, plus *aquoll,* the suborder of the Mollisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Endoaquolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, cation-exchange activity class, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, superactive, mesic Typic Endoaquolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Ashkum series.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 2003). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings “Use and Management of the Soils” and “Soil Properties.”

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Ozaukee silt loam, 2 to 4 percent slopes, is a phase of the Ozaukee series.

A map unit is named for the component or components that make up a dominant percentage of the map unit. Many map units consist of one dominant component. These map units are consociations. Ashkum silty clay loam, 0 to 2 percent slopes, is an example.

Some map units are made up of two or more dominant components. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more components in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The components of a complex cannot be mapped separately at the scale of mapping. Attempting to delineate the individual components of a complex would result in excessive clutter that could make the map illegible. The pattern and proportion of the components in a complex are somewhat similar in all areas. Casco-Rodman complex, 12 to 20 percent slopes, eroded, is an example.

An *undifferentiated group* is made up of two or more components that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the components in a mapped area are not uniform. An area can be made up of only one of the dominant components, or it can be made up of all of them. Grays and Markham silt loams, 2 to 4 percent slopes, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Adrian Series

Drainage class: Very poorly drained
Permeability: Moderately slow in the upper part; rapid in the lower part
Landform: Beach terraces and lake terraces
Parent material: Herbaceous organic material over outwash
Slope range: 0 to 2 percent
Taxonomic classification: Sandy or sandy-skeletal, mixed, euic, mesic Terric Haplosaprists

Typical Pedon

Adrian muck, ponded, 0 to 2 percent slopes; at an elevation of 586 feet; 1,674 feet north and 1,068 feet west of the southeast corner of sec. 34, T. 46 N., R. 12 E., in Lake County, Illinois; USGS Zion topographic quadrangle; lat. 42 degrees 25 minutes 06 seconds N. and long. 87 degrees 48 minutes 35 seconds W., NAD 27:

Oa1—0 to 6 inches; muck (sapric material), black (10YR 2/1) broken face and rubbed; about 15 percent fiber, less than 5 percent rubbed; weak fine granular structure; friable; many very fine and fine roots; common fine light gray (5Y 7/1) shell fragments throughout; violently effervescent; moderately alkaline; clear smooth boundary.

Oa2—6 to 13 inches; muck (sapric material), black (10YR 2/1) broken face and rubbed; about 10 percent fiber, less than 5 percent rubbed; weak fine and medium subangular blocky structure; friable; many very fine and fine roots; common fine light gray (5Y 7/1) shell fragments throughout; strongly effervescent; slightly alkaline; clear smooth boundary.

Oa3—13 to 22 inches; muck (sapric material), very dark brown (10YR 2/2) broken face and black (7.5YR 2.5/1) rubbed; about 5 percent fiber, 1 percent rubbed; weak medium subangular blocky structure; friable; common very fine and fine and few medium roots; slightly alkaline; clear smooth boundary.

Oa4—22 to 26 inches; muck (sapric material), 95 percent very dark brown (7.5YR 2.5/2) and 5 percent black (7.5YR 2.5/1) broken face and black (7.5YR 2.5/1) rubbed; about 5 percent fiber, 1 percent rubbed; weak medium subangular blocky structure; friable; common very fine and fine roots; very few distinct gray (2.5Y 6/1) sand grains on faces of peds; slightly alkaline; clear wavy boundary.

Cg—26 to 60 inches; 55 percent gray (2.5Y 6/1) and 45 percent gray (2.5Y 5/1) sand; single grain; loose; 5 percent dark gray (2.5Y 4/1) sedimentary peat; massive; very friable; few very fine and fine roots; few fine distinct white (2.5Y 8/1) shell fragments throughout; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the organic material: 16 to 51 inches

Surface tier:
Hue—10YR or N
Value—2 to 3
Chroma—0 to 2

Subsurface tier:
Hue—10YR, 7.5YR, or N
Value—2 or 2.5
Chroma—0 to 3

Cg horizon:
Hue—10YR to 5Y or N
Value—2 to 6
Chroma—0 to 3
Texture—sand, coarse sand, loamy sand, or gravelly sand

4777A—Adrian muck, ponded, 0 to 2 percent slopes

Setting

Landform: Beach terraces and lake terraces
Position on the landform: Toeslopes

Map Unit Composition

Adrian and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less organic matter in the surface layer than the Adrian soil
- Soils that have organic deposits more than 51 inches thick

Dissimilar soils:
- The poorly drained Granby soils on toeslopes

Properties and Qualities of the Adrian Soil

Parent material: Herbaceous organic material over outwash
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 12.4 inches
Content of organic matter in the surface layer: 70 to 99 percent
Shrink-swell potential: Low
Depth and months of the highest apparent seasonal high water table: At the surface to 0.5 foot below the surface, January through December
Ponding depth: 0 to 2 feet, January through December
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: High

Interpretive Groups

Land capability classification: 7w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Aptakisic Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon

Aptakisic silt loam, 0 to 2 percent slopes; at an elevation of 648 feet; 2,250 feet south and 15 feet east of the northwest corner of sec. 11, T. 43 N., R. 11 E., in Lake County, Illinois; USGS Wheeling topographic quadrangle; lat. 42 degrees 13 minutes 10 seconds N. and long. 87 degrees 55 minutes 31 seconds W., NAD 27:

A—0 to 3 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 6/1) dry; weak very fine granular structure; friable; common very fine and fine roots; neutral; abrupt smooth boundary.

E—3 to 8 inches; light brownish gray (10YR 6/2) silt loam; weak thin and very thin platy structure; friable; common very fine and fine roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; brown (10YR 5/3) silty clay loam; weak fine prismatic structure parting to moderate fine and medium subangular blocky; firm; common very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common distinct light gray (10YR 7/1) (dry) silt coatings on faces of peds; many fine faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; strongly acid; clear smooth boundary.

Bt2—14 to 24 inches; grayish brown (10YR 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium angular and subangular blocky; firm; common very fine and fine roots; few distinct dark gray (10YR 4/1) clay films on faces of peds; many fine distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

2BC—24 to 33 inches; 55 percent yellowish brown (10YR 5/6) and 45 percent gray (10YR 6/1) silt loam with thin strata of sand; weak medium angular blocky structure; friable; few very fine and fine roots; 1 percent gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

2Cg—33 to 80 inches; 60 percent gray (10YR 6/1) and 40 percent yellowish brown (10YR 5/6 and 5/8), stratified silt loam and fine sandy loam; massive; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam

2Bt or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, sandy loam, or silt loam

2Cg horizon:
Hue—10YR or 2.5Y

Value—2 to 4
Chroma—1 to 8
Texture—stratified loamy sand to clay loam
Content of gravel—less than 15 percent

365A—Aptakisic silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes and summits

Map Unit Composition

Aptakisic and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a darker surface layer and subsurface layer than those of the Aptakisic soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Aptakisic Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

982A—Aptakisic and Nappanee silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Footslopes and summits

Map Unit Composition

Aptakisic and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Aptakisic and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Aptakisic Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6.1 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate

Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Aptakisic—2w; Nappanee—3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Aptakisic—not hydric; Nappanee—not hydric

982B—Aptakisic and Nappanee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Aptakisic and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Aptakisic and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Aptakisic Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High

Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Aptakisic—2e; Nappanee—3e
Prime farmland status: Prime farmland
Hydric soil status: Aptakisic—not hydric; Nappanee—not hydric

Ashkum Series

Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Colluvium and the underlying till
Slope range: 0 to 2 percent
Taxonomic classification: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Ashkum silty clay loam, 0 to 2 percent slopes; at an elevation of 705 feet; 96 feet south and 2,030 feet east of the northwest corner of sec. 22, T. 34 N., R. 11 E., in Will County, Illinois; USGS Manhattan topographic quadrangle; lat. 41 degrees 25 minutes 28 seconds N. and long. 87 degrees 57 minutes 24 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; many very fine roots; neutral; clear smooth boundary.
A—7 to 12 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; neutral; clear smooth boundary.
BAg—12 to 18 inches; dark gray (2.5Y 4/1) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; common fine very dark gray (7.5YR

3/1) very weakly cemented iron and manganese oxide concretions throughout; neutral; clear smooth boundary.

Bg1—18 to 29 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (7.5YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; neutral; clear wavy boundary.

2Bg2—29 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/8) and faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint gray (5Y 5/1) iron depletions in the matrix; 8 percent gravel; neutral; gradual wavy boundary.

2BCg—49 to 54 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to weak coarse angular blocky; firm; few very fine roots; common fine very dark gray (10YR 3/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent yellowish brown (10YR 5/6) and faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine and medium faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2Cg—54 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; common fine prominent yellowish brown (10YR 5/6) and common fine and medium faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine faint gray (2.5Y 5/1) iron depletions in the matrix; 8 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the colluvium: 15 to 40 inches
Depth to carbonates: 24 to 60 inches
Thickness of the solum: 30 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Bg horizon:
Hue—2.5Y, 5Y, 5GY, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam

2Cg horizon:
Hue—2.5Y, 5Y, 5GY, or N
Value—5 or 6
Chroma—0 to 2
Texture—silty clay loam
Content of gravel—less than 10 percent

232A—Ashkum silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Toeslopes

Map Unit Composition

Ashkum and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that contain less clay and more sand or silt in the subsoil than the Ashkum soil
- Soils that are overlain by recent, light-colored deposition
- Soils that are darker in the upper part of the subsoil than the Ashkum soil

Dissimilar soils:
- The somewhat poorly drained Beecher, Blount, and Elliott soils on summits and footslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Ashkum Soil

Parent material: Colluvium and the underlying till
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.8 inches
Content of organic matter in the surface layer: 3 to 7 percent
Shrink-swell potential: High
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Barrington Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Barrington silt loam, 2 to 4 percent slopes; at an elevation of 627 feet; 400 feet north and 190 feet west of the center of sec. 16, T. 30 N., R. 3 E., in Livingston County, Illinois; USGS Long Point topographic quadrangle; lat. 41 degrees 04 minutes 07 seconds N. and long. 88 degrees 52 minutes 52 seconds W., NAD 27:

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

BA—11 to 16 inches; brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure parting to moderate fine granular; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few distinct brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

Bt3—26 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; friable; few distinct brown (10YR 4/3) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; neutral; clear smooth boundary.

2Bt4—32 to 37 inches; yellowish brown (10YR 5/4) silt loam; weak fine prismatic structure parting to weak medium angular blocky; friable; very few distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—37 to 42 inches; yellowish brown (10YR 5/4) silt loam with thin strata of fine sandy loam; weak fine prismatic structure; friable; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

2C—42 to 60 inches; yellowish brown (10YR 5/4), stratified silt loam and fine sandy loam; massive; friable; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess or other silty material: 22 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 25 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—loam, silt loam, sandy loam, very fine sandy loam, or clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—stratified fine sand to silt loam
Content of gravel—less than 15 percent

443A—Barrington silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Barrington and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have outwash beginning at a depth of less than 22 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a thinner surface layer than that of the Barrington soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Barrington Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches

Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

443B—Barrington silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Barrington and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have outwash beginning at a depth of less than 22 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have slopes of less than 2 percent
- Soils that have a thinner surface layer than that of the Barrington soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Barrington Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April

Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

984B—Barrington and Varna silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Barrington and similar soils: 45 percent
Varna and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner surface layer than that of the Barrington and Varna soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Barrington Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 8.7 inches
Content of organic matter in the surface layer: 2.5 to 4.0 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Barrington—2e; Varna—2e
Prime farmland status: Prime farmland
Hydric soil status: Barrington—not hydric; Varna—not hydric

367—Beach sand

- This map unit occurs as a strip along the shoreline of Lake Michigan. It consists of sand and water-rounded stones. Areas of this map unit are not stable enough to support vegetation because they are reworked during storms or periods when the water level is high. They are suitable for recreational uses (fig. 6).

Beecher Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Udollic Epiaqualfs

Typical Pedon

Beecher silt loam, 0 to 2 percent slopes; at an elevation of 655 feet; 340 feet south and 65 feet west of the northeast corner of sec. 14, T. 31 N., R. 12 E., in Kankakee County, Illinois; USGS Bradley topographic quadrangle; lat. 41 degrees 10 minutes 36 seconds N. and long. 87 degrees 47 minutes 56 seconds W., NAD 27:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine granular structure; friable; neutral; abrupt smooth boundary.
BE—9 to 13 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate very fine granular structure; friable; common distinct very dark gray (10YR 3/1) organic

Figure 6.—An area of Beach sand at Illinois Beach State Park. Lake Michigan is in the background.

coatings on faces of peds; few fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

2Bt1—13 to 16 inches; brown (10YR 5/3) silty clay loam; moderate very fine subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; moderately acid; clear smooth boundary.

2Bt2—16 to 21 inches; grayish brown (10YR 5/2) silty clay loam; moderate very fine and fine subangular blocky structure; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark gray (10YR 4/1) clay films on faces of peds; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; moderately acid; clear smooth boundary.

2Bt3—21 to 27 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine dark brown (7.5YR 3/3) and black (10YR 2/1) iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; 2 percent gravel; slightly alkaline; clear smooth boundary.

2Bt4—27 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) and common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; many medium prominent gray (5Y 5/1) iron depletions in the matrix; 2 percent gravel; slightly alkaline; clear smooth boundary.

2BCt—32 to 37 inches; yellowish brown (10YR 5/6) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; many coarse prominent gray (5Y 5/1) iron depletions in the matrix; 2 percent gravel; slightly effervescent; moderately alkaline; clear smooth boundary.

2Cd—37 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; few fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/8) and distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine prominent greenish gray (5GY 5/1) iron depletions in the matrix; common medium prominent greenish gray (5G 6/1) iron depletions on cleavage planes; 5 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 18 inches
Depth to carbonates: 20 to 42 inches
Thickness of the solum: 24 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2
Texture—silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay

2BCt or 2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam
Content of gravel—less than 5 percent

298A—Beecher silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Footslopes and summits

Map Unit Composition

Beecher and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a lighter colored surface layer than that of the Beecher soil

- Soils that have less clay and more sand or silt in the subsoil than the Beecher soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have slopes of more than 2 percent
- Soils that have a thicker dark surface layer than that of the Beecher soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

298B—Beecher silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Beecher and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a lighter colored surface layer than that of the Beecher soil
- Soils that have less clay and more sand or silt in the subsoil than the Beecher soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.4 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

978A—Wauconda and Beecher silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Footslopes and summits

Map Unit Composition

Wauconda and similar soils: 45 percent
Beecher and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Wauconda and Beecher soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Beecher soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash

Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2w; Beecher—2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Wauconda—not hydric; Beecher—not hydric

978B—Wauconda and Beecher silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Wauconda and similar soils: 45 percent
Beecher and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Wauconda and Beecher soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Beecher soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.7 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.4 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2e; Beecher—2e
Prime farmland status: Prime farmland
Hydric soil status: Wauconda—not hydric; Beecher—not hydric

Blount Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Ground moraines and end moraines
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Blount silt loam, 0 to 2 percent slopes; at an elevation of 705 feet; 2,480 feet south and 1,203 feet west of the northeast corner of sec. 29, T. 26 N., R. 6 E., in Livingston County, Illinois; USGS Fairbury topographic quadrangle; lat. 40 degrees 41 minutes 39 seconds N. and long. 88 degrees 32 minutes 59 seconds W., NAD 27:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; few fine roots; moderately acid; abrupt smooth boundary.

E—7 to 13 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; moderate thin platy structure; friable; few fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; abrupt smooth boundary.

2Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; weak fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; 3 percent gravel; moderately acid; clear smooth boundary.

2Bt2—17 to 26 inches; grayish brown (10YR 5/2) silty clay; weak medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 3 percent gravel; slightly acid; clear smooth boundary.

2Bt3—26 to 32 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct gray (5Y 5/1) clay films on faces of peds; many medium prominent gray (5Y 6/1) iron depletions in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Cd—32 to 60 inches; 60 percent light olive brown (2.5Y 5/4) and 40 percent gray (5Y 6/1) silty clay loam; massive; very firm; common medium prominent white (10YR 8/1) calcium carbonate concretions throughout; 5 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 18 inches
Depth to carbonates: 19 to 40 inches
Thickness of the solum: 30 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, silty clay, or clay loam
Content of gravel—2 to 10 percent

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or clay loam
Content of gravel—2 to 14 percent

23A—Blount silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Blount and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Blount soil
- Soils that have less clay and more sand or silt in the subsoil than the Blount soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have slopes of more than 2 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Blount Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 48 inches to dense material
Available water capacity to a depth of 60 inches: About 8.1 inches
Content of organic matter in the surface layer: 2 to 3 percent

Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

23B—Blount silt loam, 2 to 4 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Footslopes and backslopes

Map Unit Composition

Blount and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Blount soil
- Soils that have less clay and more sand or silt in the subsoil than the Blount soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Blount Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 30 to 48 inches to dense material
Available water capacity to a depth of 60 inches: About 8.1 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Medium

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Bowes Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon

Bowes silt loam, 0 to 2 percent slopes; at an elevation of 920 feet; 330 feet north and 330 feet west of the center of sec. 19, T. 42 N., R. 8 E., in Kane County, Illinois; USGS Elgin topographic quadrangle; lat. 42 degrees 06 minutes 13 seconds N. and long. 88 degrees 20 minutes 43 seconds W., NAD 27:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine and fine granular structure; friable; moderately acid; abrupt smooth boundary.

E—9 to 13 inches; yellowish brown (10YR 5/4) silt loam, very pale brown (10YR 7/4) dry; weak thick platy structure parting to weak fine granular; friable; slightly acid; clear smooth boundary.

Bt1—13 to 19 inches; brown (10YR 4/3) silty clay loam; moderate very fine and fine subangular blocky structure; firm; common distinct dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—19 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; weak coarse prismatic structure parting to moderate fine subangular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; gradual smooth boundary.

Bt3—28 to 36 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.

Bt4—36 to 43 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent gravel; moderately acid; clear smooth boundary.

2Bt5—43 to 46 inches; brown (10YR 4/3) gravelly clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few distinct dark yellowish brown (10YR 3/4) clay films on faces of peds; 22 percent gravel; 5 percent dolomitic cobbles; slightly alkaline; clear smooth boundary.

2Bt6—46 to 51 inches; dark brown (7.5YR 3/2) very gravelly sandy loam; weak medium subangular blocky structure; friable; common distinct very dark brown (7.5YR 2/2) organo-clay films on pebbles and occurring as bridges between sand grains; 40 percent gravel; 10 percent dolomitic cobbles; slightly alkaline; clear smooth boundary.

2C—51 to 61 inches; brown (7.5YR 4/4) very gravelly sand; single grain; loose; 45 percent gravel; 10 percent dolomitic cobbles; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 28 to 60 inches
Depth to sandy and gravelly outwash: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 40 to 65 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—2 to 6
Texture—the gravelly or very gravelly analogs of loam, sandy loam, sandy clay loam, clay loam, or loamy sand
Content of gravel—15 to 60 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 7
Chroma—3 to 6
Texture—stratified extremely gravelly coarse sand to gravelly sandy loam
Content of gravel—15 to 75 percent
Content of cobbles—5 to 35 percent

792A—Bowes silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Bowes and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Bowes soil
- Soils that have a lighter colored surface layer than that of the Bowes soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 40 inches or more than 60 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have less silt and more sand in the upper and middle parts of the subsoil than the Bowes soil

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Bowes Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.2 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

792B—Bowes silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and summits

Map Unit Composition

Bowes and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Bowes soil
- Soils that have a lighter colored surface layer than that of the Bowes soil

- Soils that have sandy and gravelly outwash beginning at a depth of less than 40 inches or more than 60 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have less silt and more sand in the upper and middle parts of the subsoil than the Bowes soil
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The well drained Lorenzo soils, which are shallow to sandy and gravelly glaciofluvial deposits; on summits and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Bowes Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Boyer Series

Drainage class: Well drained
Permeability: Moderately rapid in the upper part; very rapid in the lower part
Landform: Outwash plains and lake terraces
Parent material: Outwash
Slope range: 2 to 6 percent
Taxonomic classification: Coarse-loamy, mixed, semiactive, mesic Typic Hapludalfs

Typical Pedon

Boyer sandy loam, 4 to 6 percent slopes; at an elevation of 763 feet; 495 feet north and 750 feet west of the southeast corner of sec. 26, T. 46 N., R. 9 E., in Lake County, Illinois; USGS Fox Lake topographic quadrangle; lat. 42 degrees 25 minutes 54 seconds N. and long. 88 degrees 08 minutes 32 seconds W., NAD 27:

A—0 to 5 inches; very dark brown (10YR 2/2) sandy loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; very friable; many very fine and fine and few medium roots; common distinct light brownish gray (10YR 6/2) sand grains on faces of peds; neutral; abrupt smooth boundary.

E—5 to 10 inches; brown (7.5YR 4/4) loamy sand; weak thick platy structure parting to weak fine subangular blocky; very friable; common very fine and fine roots; few distinct dark brown (7.5YR 3/3) organic coatings on faces of peds; few distinct very dark brown (10YR 2/2) organic coatings in root channels and/or pores; 1 percent gravel; neutral; clear smooth boundary.

Bt1—10 to 16 inches; reddish brown (5YR 4/4) sandy loam; moderate fine and medium subangular blocky structure; friable; common very fine and fine roots; few distinct dark reddish brown (5YR 3/4) clay films on faces of peds and in pores; very few prominent very dark brown (10YR 2/2) organic coatings in root channels and/or pores; 1 percent gravel; neutral; clear smooth boundary.

Bt2—16 to 22 inches; yellowish red (5YR 4/6) sandy loam; moderate medium subangular blocky structure; friable; common very fine and fine roots; common distinct reddish brown (5YR 4/4) clay films on faces of peds and in pores; very few prominent very dark brown (10YR 2/2) organic coatings in root channels and/or pores; 3 percent gravel; neutral; abrupt smooth boundary.

BC—22 to 29 inches; yellowish red (5YR 4/6) loamy sand; weak fine subangular blocky structure; very friable; common very fine roots; 4 percent gravel; neutral; abrupt wavy boundary.

C1—29 to 40 inches; yellowish brown (10YR 5/4) sand; single grain; loose; common very fine roots; 4 percent gravel; strongly effervescent; slightly alkaline; gradual smooth boundary.

C2—40 to 60 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent brown (10YR 5/3) sand; single grain; loose; common very fine roots; 2 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to sandy outwash: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 to 5
Chroma—1 to 3
Texture—sandy loam

E horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—loamy sand or sandy loam

Bt horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam, gravelly sandy loam, or loam; loamy sand included in the lower part

C horizon:
Hue—7.5YR or 10YR
Value—4 to 7
Chroma—3 to 6
Texture—stratified very gravelly coarse sand to loamy sand

Content of gravel—1 to 50 percent
Content of cobbles—less than 10 percent

706B—Boyer sandy loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and lake terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Boyer and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more sand in the subsoil than the Boyer soil
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The poorly drained Dunham and Pella soils on toeslopes

Properties and Qualities of the Boyer Soil

Parent material: Outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 5.5 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Low for steel and moderate for concrete
Surface runoff class: Very low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderately high

Interpretive Groups

Land capability classification: 3s
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

706C—Boyer sandy loam, 4 to 6 percent slopes

Setting

Landform: Outwash plains and lake terraces
Position on the landform: Backslopes and shoulders

Map Unit Composition

Boyer and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more sand in the subsoil than the Boyer soil
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that are moderately eroded

Dissimilar soils:
- The poorly drained Dunham and Pella soils on toeslopes

Properties and Qualities of the Boyer Soil

Parent material: Outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 5.3 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Low for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Moderately high

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Camden Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 5 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Camden silt loam, 0 to 2 percent slopes; at an elevation of 855 feet; 100 feet south and 1,700 feet west of the northeast corner of sec. 18, T. 45 N., R. 5 E., in McHenry County, Illinois; USGS Capron topographic quadrangle; lat. 42 degrees 23 minutes 06 seconds N. and long. 88 degrees 41 minutes 34 seconds W., NAD 27:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.

BE—9 to 14 inches; dark yellowish brown (10YR 4/4) silt loam; weak thick platy structure parting to weak fine subangular blocky; friable; common very fine and fine roots; few distinct brown (10YR 4/3) clay films and very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; slightly acid; clear smooth boundary.

Bt1—14 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct brown (10YR 4/3) clay films and very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; moderately acid; clear smooth boundary.

Bt2—21 to 29 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; moderately acid; clear wavy boundary.

2Bt3—29 to 37 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; 1 percent gravel; moderately acid; clear wavy boundary.

2Bt4—37 to 51 inches; dark yellowish brown (10YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; 1 percent gravel; slightly acid; clear wavy boundary.

2Bt5—51 to 60 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; firm; few distinct dark brown (7.5YR 3/4) clay films on faces of peds and in pores; 3 percent gravel; neutral; clear smooth boundary.

2C—60 to 71 inches; 45 percent brown (10YR 4/3), 45 percent dark yellowish brown (10YR 4/4), and 10 percent very dark grayish brown (10YR 3/2), stratified coarse sandy loam and loam; massive; friable; 4 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 24 to 40 inches
Depth to carbonates: More than 60 inches
Thickness of the solum: 40 to 65 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6

Texture—silt loam, loam, sandy loam, clay loam, or sandy clay loam
Content of gravel—less than 10 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—stratified silt loam to loamy sand
Content of gravel—less than 13 percent

134A—Camden silt loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces and outwash plains
Position on the landform: Summits

Map Unit Composition

Camden and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have more gravel in the lower part of the profile than the Camden soil
- Soils that have carbonates at a depth of less than 60 inches
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The well drained Fox soils, which are moderately deep to sandy and gravelly glaciofluvial deposits; on summits
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Camden Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.7 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1

Prime farmland status: Prime farmland
Hydric soil status: Not hydric

134B—Camden silt loam, 2 to 5 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Camden and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have more gravel in the lower part of the profile than the Camden soil
- Soils that have carbonates at a depth of less than 60 inches
- Soils that have slopes of less than 2 percent
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The well drained Fox soils, which are moderately deep to sandy and gravelly glaciofluvial deposits; on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Camden Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.4 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Casco Series

Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, end moraines, and kames

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Slope range: 2 to 30 percent
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Inceptic Hapludalfs

Typical Pedon

Casco loam, 2 to 6 percent slopes; at an elevation of 1,054 feet; 100 feet north and 200 feet east of the southwest corner of the southeast quarter of sec. 6, T. 14 N., R. 20 E., in Sheboygan County, Wisconsin; USGS Dundee, Wisconsin, topographic quadrangle; lat. 43 degrees 42 minutes 13 seconds N. and long. 88 degrees 08 minutes 57 seconds W., NAD 27:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loam, pale brown (10YR 6/3) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; common fine roots; slightly acid; abrupt smooth boundary.
Bt1—8 to 13 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt2—13 to 17 inches; brown (7.5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm; common fine roots; common faint dark brown (7.5YR 3/4) clay films on faces of peds; common distinct dark brown (7.5YR 3/2) organo-clay films on faces of peds and on gravel near the lower boundary; about 9 percent gravel in the lower part; neutral; abrupt wavy boundary.
2C—17 to 60 inches; brown (10YR 5/3), stratified gravelly coarse sand, very gravelly coarse sand, and extremely gravelly coarse sand; single grain; loose; about 60 percent gravel as an average; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to sandy and gravelly glaciofluvial deposits: 10 to 20 inches
Depth to carbonates: 10 to 20 inches
Thickness of the solum: 10 to 20 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 or 3
Texture—loam or clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—clay loam, sandy clay loam, or loam or the gravelly analogs of these textures
Content of gravel—less than 35 percent

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 or 4
Texture—sand or coarse sand or the gravelly, very gravelly, or extremely gravelly analogs of these textures
Content of gravel—10 to 70 percent

323B—Casco loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, end moraines, and kames
Position on the landform: Backslopes and summits

Map Unit Composition

Casco and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a darker surface layer than that of the Casco soil

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.5 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

323C2—Casco loam, 4 to 6 percent slopes, eroded

Setting

Landform: Kames, end moraines, and outwash plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Casco and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a darker surface layer than that of the Casco soil

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.3 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

323D2—Casco loam, 6 to 12 percent slopes, eroded

Setting

Landform: Kames, end moraines, and outwash plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Casco and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that have a darker surface layer than that of the Casco soil
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

323D3—Casco clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: Kames, end moraines, and outwash plains
Position on the landform: Backslopes

Map Unit Composition

Casco and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded

- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The excessively drained Rodman soils on backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 3.3 inches
Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 6e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

969E2—Casco-Rodman complex, 12 to 20 percent slopes, eroded

Setting

Landform: Kames, outwash plains, and end moraines
Position on the landform: Backslopes

Map Unit Composition

Casco and similar soils: 50 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches

- Soils that have carbonates at or near the surface
- Soils that have slopes of less than 12 percent or more than 20 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The well drained Rush soils on shoulders and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.3 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Rodman Soil

Parent material: Sandy and gravelly glaciofluvial deposits
Drainage class: Excessively drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 2.6 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Low
Hazard of corrosion: Low for steel and low for concrete
Surface runoff class: Low
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Casco—6e; Rodman—6s
Prime farmland status: Not prime farmland
Hydric soil status: Casco—not hydric; Rodman—not hydric

969F—Casco-Rodman complex, 20 to 30 percent slopes

Setting

Landform: Kames, outwash plains, and end moraines
Position on the landform: Backslopes

Map Unit Composition

Casco and similar soils: 50 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have carbonates at or near the surface
- Soils that have slopes of less than 20 percent or more than 30 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The well drained Rush soils on shoulders and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 3.8 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Rodman Soil

Parent material: Sandy and gravelly glaciofluvial deposits
Drainage class: Excessively drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 2.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Low
Ponding: None

Flooding: None
Potential for frost action: Low
Hazard of corrosion: Low for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Casco—7e; Rodman—7s
Prime farmland status: Not prime farmland
Hydric soil status: Casco—not hydric; Rodman—not hydric

Del Rey Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Del Rey silt loam, 0 to 2 percent slopes; at an elevation of 663 feet; 155 feet south and 900 feet west of the northeast corner of sec. 1, T. 25 N., R. 11 E., in Iroquois County, Illinois; USGS Onarga West topographic quadrangle; lat. 40 degrees 40 minutes 43 seconds N. and long. 88 degrees 00 minutes 13 seconds W., NAD 27:

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure; friable; many fine roots; neutral; abrupt smooth boundary.

E—4 to 9 inches; light brownish gray (10YR 6/2) silt loam, light gray (10YR 7/2) dry; moderate thin and medium platy structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Bt—9 to 12 inches; brown (10YR 5/3) silty clay loam; strong fine subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films and pale brown (10YR 6/3) (dry) clay depletions on faces of peds; very strongly acid; clear smooth boundary.

Btg1—12 to 25 inches; light brownish gray (2.5Y 6/2) silty clay; strong fine and medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

Btg2—25 to 33 inches; 50 percent light brownish gray (2.5Y 6/2), 30 percent light olive brown (2.5Y 5/4), and 20 percent gray (10YR 6/1) silty clay; moderate fine and medium angular and subangular blocky structure; firm; common fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; strongly acid; gradual smooth boundary.

BCtg—33 to 41 inches; 35 percent light brownish gray (2.5Y 6/2), 35 percent gray (10YR 6/1), and 30 percent light olive brown (2.5Y 5/4) silty clay loam; weak coarse angular and subangular blocky structure; firm; few fine roots; common distinct grayish brown (2.5Y 5/2) clay films on vertical faces of peds; slightly alkaline; gradual smooth boundary.

Cg—41 to 60 inches; 55 percent grayish brown (10YR 5/2) and 45 percent yellowish brown (10YR 5/6 and 5/8) silty clay loam; massive; friable; few distinct light gray

(10YR 7/1) (dry) clay depletions on bedding planes; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 24 to 48 inches
Thickness of the solum: 24 to 48 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Bt, Btg, or BCtg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silty clay

C or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam or silty clay loam

192A—Del Rey silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Del Rey and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Del Rey soil
- Soils that have slopes of more than 2 percent
- Soils that have till in the lower part of the profile
- Soils that have less clay and more silt in the subsoil than the Del Rey soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Montgomery soils on toeslopes

Properties and Qualities of the Del Rey Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained

Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 8.9 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

192B—Del Rey silt loam, 2 to 4 percent slopes

Setting

Landform: Lake plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Del Rey and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Del Rey soil
- Soils that have slopes of less than 2 percent
- Soils that have till in the lower part of the profile
- Soils that have less clay and more silt in the subsoil than the Del Rey soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Montgomery soils on toeslopes

Properties and Qualities of the Del Rey Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 8.4 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May

Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Dresden Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, stream terraces, and kames
Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Slope range: 0 to 4 percent
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Mollic Hapludalfs

Typical Pedon

Dresden silt loam, 2 to 4 percent slopes; at an elevation of 805 feet; 720 feet south and 1,340 feet west of the center of sec. 21, T. 41 N., R. 8 E., in Kane County, Illinois; USGS Elgin topographic quadrangle; lat. 42 degrees 01 minute 10 seconds N. and long. 88 degrees 20 minutes 10 seconds W., NAD 27:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
BE—7 to 11 inches; brown (10YR 4/3) silt loam; weak very fine subangular blocky structure; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.
Bt1—11 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.
2Bt2—19 to 27 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 5 percent gravel; slightly acid; clear smooth boundary.
2Bt3—27 to 32 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak coarse subangular blocky structure; friable; few very fine roots; common distinct brown (7.5YR 4/3) and dark brown (7.5YR 3/3) clay films on faces of peds; 13 percent gravel; neutral; abrupt smooth boundary.
3C—32 to 60 inches; yellowish brown (10YR 5/4) gravelly sand; single grain; loose; 34 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 20 inches
Depth to sandy and gravelly glaciofluvial deposits: 24 to 40 inches

Depth to carbonates: 24 to 40 inches
Thickness of the solum: 24 to 40 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—2 or 3
Texture—silt loam

Bt or 2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam, clay loam, loam, or sandy clay loam; the gravelly or very gravelly analogs of these textures included in the lower part
Content of gravel—less than 45 percent

3C horizon:
Hue—7.5YR or 10YR
Value—4 to 7
Chroma—2 to 6
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—20 to 75 percent

325A—Dresden silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Summits

Map Unit Composition

Dresden and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Dresden soil
- Soils that have a lighter colored surface layer than that of the Dresden soil
- Soils that have less sand and more silt in the upper one-half of the profile than the Dresden soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 24 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Dresden Soil

Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 6.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2s
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

325B—Dresden silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, stream terraces, and kames
Position on the landform: Backslopes and summits

Map Unit Composition

Dresden and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a lighter colored surface layer than that of the Dresden soil
- Soils that have less sand and more silt in the upper one-half of the profile than the Dresden soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 24 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Dresden Soil

Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid

Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 6.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Dunham Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Dunham silty clay loam, 0 to 2 percent slopes; at an elevation of 877 feet; 939 feet south and 81 feet west of the center of sec. 15, T. 45 N., R. 5 E., in McHenry County, Illinois; USGS Capron topographic quadrangle; lat. 42 degrees 22 minutes 33 seconds N. and long. 88 degrees 38 minutes 16 seconds W., NAD 27:

Ap—0 to 6 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; neutral; clear smooth boundary.

A—6 to 12 inches; black (N 2.5/0) silty clay loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; moderately acid; abrupt smooth boundary.

BAg—12 to 15 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium subangular blocky structure; friable; common very fine roots; common distinct very dark gray (2.5Y 3/1) organic coatings on faces of peds and in pores; few fine strong brown (7.5YR 5/6) very weakly cemented iron oxide concretions throughout; common fine distinct olive brown (2.5Y 4/4) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Btg1—15 to 24 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; very few distinct very dark gray (2.5Y 3/1) organic coatings in root channels and in pores; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine strong brown (7.5YR 5/6) very weakly cemented iron oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) and common fine and medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly acid; gradual smooth boundary.

Btg2—24 to 31 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; very few distinct very dark grayish brown (2.5Y 3/2) organic coatings in root channels and in pores; few fine dark brown (7.5YR 3/4) very weakly cemented iron oxide concretions throughout; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Btg3—31 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; very few distinct very dark grayish brown (2.5Y 3/2) organic coatings in root channels and in pores; many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Btg4—35 to 39 inches; olive gray (5Y 5/2) clay loam; weak medium subangular blocky structure; friable; few very fine roots; few distinct olive gray (5Y 4/2) clay films on faces of peds; very few distinct dark olive gray (5Y 3/2) organic coatings in root channels and in pores; many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 3 percent gravel; neutral; abrupt smooth boundary.

3Cg—39 to 44 inches; olive gray (5Y 5/2) gravelly sandy loam; massive; very friable; few very fine roots; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; common fine faint light olive gray (5Y 6/2) iron depletions in the matrix; 25 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

3C—44 to 60 inches; brown (10YR 5/3) gravelly loamy sand and gravelly loamy fine sand; single grain; loose; few very fine roots; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 25 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess or other silty material: 24 to 50 inches
Depth to sandy and gravelly outwash: 32 to 55 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 36 to 55 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam or silt loam

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 or 6
Chroma—0 to 2

Texture—loam, silt loam, clay loam, sandy clay loam, or sandy loam or the gravelly analogs of these textures
Content of gravel—less than 20 percent

3Cg or 3C horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 7
Chroma—0 to 8
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, loamy coarse sand, fine sand, loamy fine sand, or sandy loam
Content of gravel—15 to 70 percent

523A—Dunham silty clay loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes

Map Unit Composition

Dunham and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner surface layer than that of the Dunham soil
- Soils that have less silt and more sand in the upper one-half of the profile than the Dunham soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 32 inches or more than 55 inches

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Dunham Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.3 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Elliott Series

Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon

Elliott silt loam, 0 to 2 percent slopes; at an elevation of 704 feet; 690 feet south and 2,436 feet west of the center of sec. 21, T. 29 N., R. 8 E., in Livingston County, Illinois; USGS Cullom topographic quadrangle; lat. 40 degrees 58 minutes 12 seconds N. and long. 88 degrees 19 minutes 17 seconds W., NAD 27:

Ap—0 to 6 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

A—6 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

Bt1—11 to 16 inches; light olive brown (2.5Y 5/4) silty clay; moderate fine subangular blocky structure; friable; common fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; neutral; clear smooth boundary.

2Bt2—16 to 23 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt3—23 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; friable; few fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; neutral; clear smooth boundary.

2Bt4—28 to 35 inches; olive brown (2.5Y 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few medium white (10YR 8/1) calcium carbonate concretions throughout; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 1 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt5—35 to 41 inches; olive brown (2.5Y 4/4) silty clay loam; weak fine prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common distinct gray (5Y 6/1) clay films on faces of peds; few fine distinct yellowish brown

(10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.

2Cd—41 to 60 inches; olive brown (2.5Y 4/4) silty clay loam; massive; very firm; common fine prominent gray (5Y 5/1) iron depletions in the matrix; 3 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess or other silty material: Less than 20 inches
Depth to carbonates: 17 to 40 inches
Thickness of the solum: 20 to 45 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay
Content of gravel—less than 10 percent

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam
Content of gravel—less than 15 percent

146A—Elliott silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Footslopes and summits

Map Unit Composition

Elliott and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a thinner subsurface layer than that of the Elliott soil
- Soils that have slopes of more than 2 percent
- Soils that have less clay and more sand or silt in the subsoil than the Elliott soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till

Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.3 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

146B—Elliott silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Elliott and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have less clay and more sand or silt in the subsoil than the Elliott soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May

Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

989A—Mundelein and Elliott silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and footslopes

Map Unit Composition

Mundelein and similar soils: 45 percent
Elliott and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner subsurface layer than that of the Mundelein and Elliott soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.3 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Mundelein—1; Elliott—2w
Prime farmland status: Prime farmland
Hydric soil status: Mundelein—not hydric; Elliott—not hydric

989B—Mundelein and Elliott silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Mundelein and similar soils: 45 percent
Elliott and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner subsurface layer than that of the Mundelein and Elliott soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches

Available water capacity to a depth of 60 inches: About 9.5 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Mundelein—2e; Elliott—2e
Prime farmland status: Prime farmland
Hydric soil status: Mundelein—not hydric; Elliott—not hydric

Fox Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, end moraines, and kames
Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Slope range: 0 to 12 percent
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Fox silt loam, 0 to 2 percent slopes; at an elevation of 850 feet; 1,600 feet south and 1,930 feet east of the northwest corner of sec. 32, T. 7 N., R. 13 E., in Jefferson County, Wisconsin; USGS Lake Mills, Wisconsin, topographic quadrangle; lat. 43 degrees 01 minute 59 seconds N. and long. 88 degrees 59 minutes 10 seconds W., NAD 27:

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine subangular blocky structure; very friable; slightly acid; abrupt smooth boundary.

Bt1—10 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; weak very fine subangular blocky structure; friable; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear wavy boundary.

Bt2—15 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; few faint dark brown (10YR 3/3) clay films on faces of peds; moderately acid; clear wavy boundary.

2Bt3—21 to 29 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common prominent very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear wavy boundary.

2Bt4—29 to 33 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; firm; common distinct dark brown (7.5YR 3/2) clay films on faces of peds; about 5 percent gravel; slightly alkaline; clear wavy boundary.

3C1—33 to 45 inches; yellowish brown (10YR 5/4), stratified gravelly sand and cobbly sand; single grain; loose; about 30 percent gravel and 30 percent cobbles as an average; strongly effervescent; moderately alkaline; clear wavy boundary.

3C2—45 to 60 inches; light yellowish brown (10YR 6/4), stratified very gravelly sand, extremely gravelly sand, and gravel; single grain; loose; about 65 percent gravel as an average; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 24 inches
Depth to sandy and gravelly glaciofluvial deposits: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—3 or 4
Texture—clay loam, loam, sandy clay loam, or sandy loam or the gravelly analogs of these textures
Content of gravel—less than 35 percent

3C horizon:
Hue—7.5YR or 10YR
Value—4 to 7
Chroma—3 or 4
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand or coarse sand
Content of gravel—15 to 70 percent

327A—Fox silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, end moraines, and kames
Position on the landform: Summits

Map Unit Composition

Fox and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Fox soil
- Soils that have less sand and more silt in the upper one-half of the profile than the Fox soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Fox Soil

Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 7 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2s
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

327B—Fox silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains, kames, and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Fox and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a darker surface layer than that of the Fox soil
- Soils that have less sand and more silt in the upper one-half of the profile than the Fox soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Fox Soil

Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 6.6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

327C2—Fox silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains, end moraines, and kames
Position on the landform: Backslopes and shoulders

Map Unit Composition

Fox and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have less sand and more silt in the upper one-half of the profile than the Fox soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Fox Soil

Parent material: Thin mantle of loess or other silty material and the underlying loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 7 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

327D2—Fox loam, 6 to 12 percent slopes, eroded

Setting

Landform: Outwash plains, kames, and end moraines
Position on the landform: Backslopes and shoulders (fig. 7)

Map Unit Composition

Fox and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 6 percent or more than 12 percent

Figure 7.—An area of Fox loam, 6 to 12 percent slopes, eroded, used for wildlife habitat and recreational activities in Chain O'Lakes State Park. Houghton muck, undrained, 0 to 2 percent slopes, is in the foreground.

- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that are severely eroded

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Fox Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 6.1 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium

Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Frankfort Series

Drainage class: Somewhat poorly drained
Permeability: Slow in the upper part; very slow in the lower part
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Udollic Epiaqualfs

Typical Pedon

Frankfort silt loam, 2 to 4 percent slopes; at an elevation of 675 feet; 2,500 feet south and 300 feet east of the northwest corner of sec. 26, T. 44 N., R. 11 E., in Lake County, Illinois; USGS Libertyville topographic quadrangle; lat. 42 degrees 15 minutes 46 seconds N. and long. 87 degrees 55 minutes 27 seconds W., NAD 27:

A—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.

EB—8 to 12 inches; dark grayish brown (10YR 4/2) silty clay loam, light brownish gray (10YR 6/2) dry; weak thick platy structure parting to weak fine subangular blocky; friable; common very fine and fine roots; many prominent very dark gray (10YR 3/1) organic coatings on faces of peds and in pores; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt—12 to 18 inches; brown (10YR 4/3) silty clay; moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on surfaces along pores; many continuous distinct dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; common fine and medium prominent strong brown (7.5YR 5/6) weakly cemented iron oxide concretions throughout; few fine prominent black (7.5YR 2.5/1) strongly cemented manganese oxide concretions throughout; common fine and medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; slightly acid; gradual wavy boundary.

Btg1—18 to 24 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine and medium prismatic structure parting to moderate fine and medium subangular blocky; firm; common very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on surfaces along pores; many distinct dark gray (10YR 4/1) clay films on faces of peds and in pores; common medium prominent strong brown (7.5YR 5/6) weakly cemented iron oxide concretions throughout; few fine prominent black (7.5YR 2.5/1) strongly cemented manganese oxide concretions throughout; common fine and medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; 1 percent gravel; neutral; gradual wavy boundary.

Btg2—24 to 32 inches; grayish brown (10YR 5/2) silty clay; moderate medium and coarse prismatic structure parting to weak medium and coarse subangular blocky; firm; common prominent very dark brown (10YR 2/2) organo-clay films on faces of peds and in pores; few fine prominent reddish yellow (7.5YR 7/6) masses of iron accumulation in the matrix; common fine and medium prominent reddish yellow (7.5YR 6/8) weakly cemented iron oxide concretions throughout; common fine prominent black (7.5YR 2.5/1) strongly cemented manganese oxide concretions throughout; many medium faint gray (2.5Y 6/1) iron depletions in the matrix; 2 percent gravel; neutral; clear wavy boundary.

BCg—32 to 37 inches; 60 percent gray (10YR 6/1) and 40 percent brown (10YR 5/3) silty clay; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; few distinct very dark gray (10YR 3/1) organic coatings on surfaces along pores; common fine prominent dark yellowish brown (10YR 4/6) weakly cemented iron oxide concretions throughout; common medium distinct white (10YR 8/1) carbonate masses throughout; 2 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cdg—37 to 60 inches; 60 percent gray (2.5Y 5/1) and 40 percent dark yellowish brown (10YR 4/4) silty clay loam; massive; very firm; few prominent very dark gray (10YR 3/1) organic coatings on surfaces along pores; common medium distinct brown (10YR 5/3) weakly cemented iron oxide concretions throughout; common coarse prominent white (10YR 8/1) carbonate masses throughout; 1 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 20 inches
Depth to carbonates: 18 to 40 inches
Thickness of the solum: 24 to 42 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bt or Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silty clay or clay
Content of gravel—less than 7 percent

Cdg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay, silty clay loam, or clay
Content of gravel—less than 10 percent

320A—Frankfort silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Footslopes and summits

Map Unit Composition

Frankfort and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Frankfort soil
- Soils that have slopes of more than 2 percent
- Soils that have a lighter colored surface layer than that of the Frankfort soil
- Soils that have a darker subsurface layer than that of the Frankfort soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 5.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

320B—Frankfort silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Frankfort and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Frankfort soil
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a lighter colored surface layer than that of the Frankfort soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

- Soils that are moderately eroded
- Soils that have a darker subsurface layer than that of the Frankfort soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

320B2—Frankfort silty clay loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Frankfort and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Frankfort soil
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are only slightly eroded
- Soils that have a lighter colored surface layer than that of the Frankfort soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 4.9 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

981A—Wauconda and Frankfort silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and footslopes

Map Unit Composition

Wauconda and similar soils: 50 percent
Frankfort and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Wauconda and Frankfort soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Frankfort soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 5.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2w; Frankfort—3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Wauconda—not hydric; Frankfort—not hydric

981B—Wauconda and Frankfort silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Wauconda and similar soils: 50 percent

Frankfort and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Wauconda and Frankfort soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Frankfort soils
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.7 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2e; Frankfort—3e
Prime farmland status: Prime farmland
Hydric soil status: Wauconda—not hydric; Frankfort—not hydric

Granby Series

Drainage class: Poorly drained
Permeability: Rapid
Landform: Outwash plains and lake terraces
Parent material: Outwash
Slope range: 0 to 2 percent
Taxonomic classification: Sandy, mixed, mesic Typic Endoaquolls

Typical Pedon

Granby fine sandy loam, 0 to 2 percent slopes; at an elevation of 630 feet; 1,360 feet north and 100 feet west of the southeast corner of sec. 21, T. 29 N., R. 11 W., in Iroquois County, Illinois; USGS Donovan topographic quadrangle; lat. 40 degrees 59 minutes 03 seconds N. and long. 87 degrees 34 minutes 53 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) fine sandy loam, dark gray (10YR 4/1) dry; weak fine granular structure; very friable; neutral; abrupt smooth boundary.

A—8 to 17 inches; very dark grayish brown (10YR 3/2) loamy sand, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak medium granular; very friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint dark grayish brown (2.5Y 4/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bg1—17 to 23 inches; dark grayish brown (2.5Y 4/2) loamy fine sand; weak fine subangular blocky structure; very friable; few coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many coarse faint dark gray (10YR 4/1) iron depletions in the matrix; neutral; clear smooth boundary.

Bg2—23 to 30 inches; dark grayish brown (2.5Y 4/2) loamy fine sand; weak medium subangular blocky structure; very friable; many medium distinct olive brown (2.5Y 4/4) masses of iron and manganese accumulation in the matrix; very dark grayish brown (2.5Y 3/2) krotovina at a depth of 25 to 30 inches; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

Cg1—30 to 40 inches; 80 percent grayish brown (10YR 5/2) and 20 percent brown (10YR 5/3) fine sand; single grain; loose; few fine prominent strong brown (7.5YR 4/6) weakly cemented iron and manganese oxide nodules throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual smooth boundary.

Cg2—40 to 76 inches; olive gray (5Y 5/2) fine sand; single grain; loose; common medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; gradual smooth boundary.

Cg3—76 to 86 inches; gray (2.5Y 5/1) fine sand; single grain; loose; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 52 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—fine sandy loam, sand, loamy fine sand, or loamy sand

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 3
Texture—fine sand, sand, loamy sand, or loamy fine sand
Content of gravel—less than 5 percent

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 to 4
Texture—sand, fine sand, loamy fine sand, or loamy sand
Content of gravel—less than 5 percent

513A—Granby fine sandy loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and lake terraces
Position on the landform: Toeslopes

Map Unit Composition

Granby and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer and subsurface layer than those of the Granby soil
- Soils that have carbonates in the upper part of the profile
- Soils that have more gravel in the lower part of the profile than the Granby soil

Dissimilar soils:
- Somewhat poorly drained, sandy soils on summits and footslopes
- The very poorly drained Adrian soils on toeslopes

Properties and Qualities of the Granby Soil

Parent material: Outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderately rapid (surface layer)
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 5.3 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Low
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: Moderate

Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderately high

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Grays Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs

Typical Pedon

Grays silt loam, 2 to 4 percent slopes; at an elevation of 790 feet; 575 feet north and 1,500 feet east of the southwest corner of sec. 14, T. 45 N., R. 10 E., in Lake County, Illinois; USGS Grayslake topographic quadrangle; lat. 42 degrees 22 minutes 22 seconds N. and long. 88 degrees 02 minutes 16 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; common very fine roots; slightly acid; gradual wavy boundary.

BE—8 to 11 inches; 70 percent dark yellowish brown (10YR 4/4) and 30 percent brown (10YR 4/3) silt loam; weak very fine and fine subangular blocky structure; friable; common very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) and few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; neutral; gradual smooth boundary.

Bt1—11 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common distinct dark brown (10YR 3/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds and in pores; many distinct brown (10YR 4/3) clay films on faces of peds; neutral; gradual wavy boundary.

Bt3—24 to 34 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; common distinct brown (10YR 4/3) clay films on faces of peds; common fine black (10YR 2/1) iron and manganese oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; slightly alkaline; clear wavy boundary.

2Bt4—34 to 42 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; common very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2C1—42 to 50 inches; yellowish brown (10YR 5/4) loam; massive; friable; common medium distinct strong brown (7.5YR 4/6) and common medium faint light yellowish brown (10YR 6/4) masses of iron accumulation in the matrix; common medium and coarse distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) iron depletions in the matrix; 4 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2—50 to 60 inches; yellowish brown (10YR 5/4), stratified loam and sandy loam; massive; very friable; common medium distinct strong brown (7.5YR 4/6) masses of iron accumulation in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 22 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Bt or BE horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, or sandy loam
Content of gravel—less than 10 percent

2C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—stratified loamy sand to silt loam
Content of gravel—less than 15 percent

698A—Grays silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Grays and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Grays soil
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 22 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

698B—Grays silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Grays and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Grays soil
- Soils that have slopes of less than 2 percent

- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 22 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

979A—Grays and Markham silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits

Map Unit Composition

Grays and similar soils: 45 percent
Markham and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Grays and Markham soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent

- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays and Markham soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material
Available water capacity to a depth of 60 inches: About 8.3 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Grays—1; Markham—2s
Prime farmland status: Prime farmland
Hydric soil status: Grays—not hydric; Markham—not hydric

979B—Grays and Markham silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Grays and similar soils: 45 percent
Markham and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Grays and Markham soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays and Markham soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material

Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Grays—2e; Markham—2e
Prime farmland status: Prime farmland
Hydric soil status: Grays—not hydric; Markham—not hydric

Grundelein Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Grundelein silt loam, 0 to 2 percent slopes; at an elevation of 885 feet; 1,875 feet south and 2,526 feet west of the northeast corner of sec. 15, T. 45 N., R. 5 E., in McHenry County, Illinois; USGS Capron topographic quadrangle; lat. 42 degrees 22 minutes 48 seconds N. and long. 88 degrees 38 minutes 14 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; neutral; clear smooth boundary.

A—7 to 11 inches; very dark brown (10YR 2/2) silt loam, brown (10YR 4/3) dry; weak medium subangular blocky structure; friable; common very fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; neutral; abrupt smooth boundary.

Bt1—11 to 19 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct black (10YR 2/1) organic coatings on faces of peds and in pores; few fine black (5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt2—19 to 29 inches; light olive brown (2.5Y 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; many medium distinct light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; many fine and medium distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; clear smooth boundary.

Bt3—29 to 33 inches; light olive brown (2.5Y 5/4) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct olive brown (2.5Y 4/4) and dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium very dark gray (10YR 3/1) wormcasts; few fine black (5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; many medium and coarse distinct grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; clear wavy boundary.

2BCg—33 to 39 inches; grayish brown (2.5Y 5/2) clay loam; weak medium and coarse subangular blocky structure; friable; few very fine roots; common medium very dark brown (10YR 2/2) wormcasts; few fine black (5YR 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine and medium prominent brownish yellow (10YR 6/6) and strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 5 percent gravel; neutral; clear wavy boundary.

3C1—39 to 46 inches; yellowish brown (10YR 5/4), stratified gravelly sandy loam and gravelly loamy sand; massive; very friable; common fine distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; 20 percent gravel; strongly effervescent; slightly alkaline; gradual wavy boundary.

3C2—46 to 60 inches; brown (10YR 5/3), stratified gravelly loamy sand, gravelly sand, and gravelly sandy loam; single grain; loose; common fine distinct brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; 20 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess or other silty material: 24 to 45 inches
Depth to sandy and gravelly outwash: 32 to 50 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 36 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—loam, clay loam, sandy clay loam, silt loam, or sandy loam or the gravelly analogs of these textures
Content of gravel—less than 20 percent

3C horizon:
Hue—7.5YR, 10YR, or 2.5Y

Value—4 to 7
Chroma—1 to 8
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, sandy loam, coarse sand, loamy coarse sand, or coarse sandy loam
Content of gravel—15 to 70 percent

526A—Grundelein silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

Map Unit Composition

Grundelein and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that have less silt and more sand in the upper one-half of the profile than the Grundelein soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 32 inches or more than 50 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The well drained Bowes soils on summits
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Grundelein Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 8.4 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Harpster Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains, lake plains, and ground moraines
Parent material: Calcareous loess or other silty material over drift
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Calciaquolls

Typical Pedon

Harpster silty clay loam, 0 to 2 percent slopes; at an elevation of 738 feet; 855 feet south and 70 feet west of the northeast corner of sec. 20, T. 23 N., R. 7 E., in Ford County, Illinois; USGS Gibson City West topographic quadrangle; lat. 40 degrees 26 minutes 24 seconds N. and long. 88 degrees 25 minutes 23 seconds W., NAD 27:

Apk—0 to 9 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; many snail shells; strongly effervescent (20 percent calcium carbonate equivalent); moderately alkaline; abrupt smooth boundary.

Ak—9 to 18 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak fine and medium granular structure; firm; common very fine roots; many snail shells; strongly effervescent (18 percent calcium carbonate equivalent); moderately alkaline; clear smooth boundary.

Bg1—18 to 25 inches; dark grayish brown (2.5Y 4/2) silty clay loam; weak fine and medium angular blocky structure; firm; common very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly effervescent (7 percent calcium carbonate equivalent); moderately alkaline; gradual smooth boundary.

Bg2—25 to 31 inches; dark gray (5Y 4/1) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular blocky; firm; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few snail shells; few fine prominent dark yellowish brown (10YR 4/4) and few fine distinct olive (5Y 4/4) masses of iron accumulation in the matrix; slightly effervescent (5 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Bg3—31 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak coarse prismatic structure parting to weak medium angular blocky; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common medium distinct olive (5Y 4/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; slightly effervescent (2 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Bg4—36 to 41 inches; 40 percent olive brown (2.5Y 4/4), 35 percent olive yellow (2.5Y 6/6), and 25 percent gray (5Y 5/1) silty clay loam; weak coarse angular blocky structure; firm; few very fine roots; 2 percent gravel; slightly effervescent (2 percent calcium carbonate equivalent); slightly alkaline; gradual smooth boundary.

Cg1—41 to 56 inches; 55 percent gray (5Y 5/1), 40 percent light olive brown (2.5Y 5/6), and 5 percent dark yellowish brown (10YR 4/4) silt loam; massive; firm; 1 percent gravel; strongly effervescent (16 percent calcium carbonate equivalent); moderately alkaline; clear smooth boundary.

Cg2—56 to 60 inches; gray (10YR 5/1) loam; massive; friable; 5 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess or other silty material: 36 to 60 inches
Depth to carbonates: Less than 16 inches
Thickness of the solum: 22 to 46 inches

Apk or Ak horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam; loam, silt loam, or clay loam included in the lower part

Cg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—silt loam or loam
Content of gravel—less than 7 percent

67A—Harpster silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains, outwash plains, and ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Harpster and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are darker in the upper part of the subsoil than the Harpster soil
- Soils that have more sand in the upper two-thirds of the profile than the Harpster soil
- Soils that have more gravel in the lower part of the profile than the Harpster soil

Dissimilar soils:
- The very poorly drained Houghton soils on toeslopes
- The poorly drained, noncalcareous Pella soils on toeslopes

Properties and Qualities of the Harpster Soil

Parent material: Calcareous loess or other silty material over drift
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 12.2 inches
Content of organic matter in the surface layer: 3.5 to 6.0 percent
Shrink-swell potential: Moderate

Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Hooppole Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part; rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Calcareous outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls

Typical Pedon

Hooppole loam, 0 to 2 percent slopes; at an elevation of 620 feet; 470 feet south and 1,940 feet west of the northeast corner of sec. 18, T. 17 N., R. 6 E., in Bureau County, Illinois; USGS Mineral topographic quadrangle; lat. 41 degrees 27 minutes 55 seconds N. and long. 89 degrees 50 minutes 46 seconds W., NAD 27:

Apk—0 to 7 inches; black (N 2.5/0) loam, very dark gray (10YR 3/1) dry; moderate medium granular structure; friable; common fine roots; violently effervescent; slightly alkaline; abrupt smooth boundary.
Ak—7 to 12 inches; black (N 2.5/0) loam, black (10YR 2/1) dry; moderate medium granular structure; friable; few fine roots; violently effervescent; slightly alkaline; clear smooth boundary.
A—12 to 17 inches; black (10YR 2/1) loam, very dark grayish brown (10YR 3/2) dry; moderate fine subangular blocky structure parting to moderate medium granular; friable; few fine roots; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.
BA—17 to 22 inches; very dark grayish brown (2.5Y 3/2) loam, dark grayish brown (2.5Y 4/2) dry; moderate fine subangular blocky structure; friable; few fine roots; common prominent black (10YR 2/1) organic coatings on faces of peds; black (10YR 2/1) loamy krotovinas and light brownish gray (10YR 6/2) sandy krotovinas; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint grayish brown (2.5Y 5/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.
Bg1—22 to 30 inches; dark grayish brown (2.5Y 4/2) loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; very dark grayish brown (2.5Y 3/2) loamy krotovinas and light brownish gray (10YR 6/2) sandy krotovinas; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the

matrix; few fine faint grayish brown (2.5Y 5/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

Bg2—30 to 38 inches; olive gray (5Y 5/2) loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct dark gray (5Y 4/1) organic coatings on faces of peds; very dark grayish brown (2.5Y 3/2) loamy krotovinas; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine faint gray (5Y 6/1) iron depletions in the matrix; strongly effervescent; slightly alkaline; clear smooth boundary.

BCg—38 to 44 inches; dark grayish brown (2.5Y 4/2) sandy loam; weak medium subangular blocky structure; friable; few fine roots; common distinct dark gray (5Y 4/1) organic coatings on faces of peds; black (10YR 2/1) loamy krotovinas; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct gray (5Y 5/1) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

2Cg—44 to 60 inches; very dark gray (5Y 3/1) and grayish brown (2.5Y 5/2) sand; single grain; loose; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to sandy outwash: 40 to 60 inches
Depth to carbonates: Less than 10 inches
Thickness of the solum: 40 to 60 inches

Apk, Ak, or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—loam, silt loam, or clay loam
Content of gravel—less than 10 percent

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 to 4
Texture—sand or loamy sand
Content of gravel—less than 15 percent

488A—Hooppole loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes

Map Unit Composition

Hooppole and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that have less sand and more silt in the upper one-half of the profile than the Hooppole soil
- Soils that have more gravel in the lower part of the profile than the Hooppole soil

Dissimilar soils:
- The very poorly drained Lena soils on toeslopes
- The poorly drained, noncalcareous Selmass soils on toeslopes

Properties and Qualities of the Hooppole Soil

Parent material: Calcareous outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 4 to 7 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Houghton Series

Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Ground moraines, end moraines, outwash plains, and lake plains
Parent material: Herbaceous organic material
Slope range: 0 to 2 percent
Taxonomic classification: Euic, mesic Typic Haplosaprists

Typical Pedon

Houghton muck, undrained, 0 to 2 percent slopes; at an elevation of 745 feet; 2,000 feet south and 1,500 feet west of the northeast corner of sec. 6, T. 44 N., R. 9 E., in McHenry County, Illinois; USGS Wauconda topographic quadrangle; lat. 42 degrees 19 minutes 23 seconds N. and long. 88 degrees 13 minutes 25 seconds W., NAD 27:

Oa1—0 to 2 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed, dark gray (10YR 4/1) dry; about 60 percent fiber, less than 15 percent rubbed; weak fine granular structure; very friable; many very fine to medium roots; neutral; abrupt smooth boundary.

Oa2—2 to 7 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 45 percent fiber, less than 5 percent rubbed; moderate fine granular structure; very friable; many very fine and fine roots; neutral; abrupt smooth boundary.

Oa3—7 to 17 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 10 percent fiber, less than 2 percent rubbed; weak medium subangular blocky structure; very friable; many very fine roots; neutral; gradual smooth boundary.

Oa4—17 to 60 inches; muck (sapric material), 85 percent black (N 2.5/0) and 15 percent very dark brown (7.5YR 2.5/2) broken face and rubbed; about 3 percent fiber, less than 1 percent rubbed; massive; very friable; common very fine roots; neutral.

Range in Characteristics

Thickness of the organic deposits: More than 51 inches

Surface tier:
Hue—10YR or N
Value—2 to 3
Chroma—0 or 1

Subsurface tier:
Hue—7.5YR, 10YR, or N
Value—2 to 3
Chroma—0 to 2

103A—Houghton muck, 0 to 2 percent slopes

Setting

Landform: End moraines, ground moraines, and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Houghton and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less organic matter in the surface layer than the Houghton soil
- Soils that have organic deposits less than 51 inches thick

Dissimilar soils:
- The very poorly drained, calcareous Lena soils on toeslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Houghton Soil

Parent material: Herbaceous organic material
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow to moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 23.9 inches
Content of organic matter in the surface layer: 70 to 99 percent
Shrink-swell potential: Not rated

Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, November through June
Ponding depth: 0 to 1 foot, November through June
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: High

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

1103A—Houghton muck, undrained, 0 to 2 percent slopes

Setting

Landform: Ground moraines, end moraines, and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Houghton and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less organic matter in the surface layer than the Houghton soil
- Soils that have organic deposits less than 51 inches thick

Dissimilar soils:
- The very poorly drained, calcareous Lena soils on toeslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Houghton Soil

Parent material: Herbaceous organic material
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow to moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 23.9 inches
Content of organic matter in the surface layer: 70 to 99 percent
Shrink-swell potential: Not rated
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, January through December
Ponding depth: 0 to 1 foot, January through December
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: High

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

4103A—Houghton muck, ponded, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Houghton and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less organic matter in the surface layer than the Houghton soil
- Soils that have organic deposits less than 51 inches thick

Dissimilar soils:
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Houghton Soil

Parent material: Herbaceous organic material
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow to moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 23.9 inches
Content of organic matter in the surface layer: 70 to 99 percent
Shrink-swell potential: Not rated
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, January through December
Ponding depth: 0 to 2 feet, January through December
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: High

Interpretive Groups

Land capability classification: 7w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Kish Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and ground moraines
Parent material: Calcareous outwash

Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls

Typical Pedon

Kish loam, 0 to 2 percent slopes; at an elevation of 865 feet; 2,025 feet south and 120 feet east of the northwest corner of sec. 29, T. 43 N., R. 7 E., in McHenry County, Illinois; USGS Huntley topographic quadrangle; lat. 42 degrees 10 minutes 37 seconds N. and long. 88 degrees 27 minutes 05 seconds W., NAD 27:

Apk—0 to 6 inches; black (10YR 2/1) loam, dark grayish brown (10YR 4/2) dry; moderate medium granular structure; friable; common very fine roots; strongly effervescent; slightly alkaline; clear smooth boundary.
Ak—6 to 11 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; 1 percent gravel; strongly effervescent; slightly alkaline; clear smooth boundary.
Bg1—11 to 21 inches; dark gray (2.5Y 4/1) loam; weak fine and medium subangular blocky structure; friable; few very fine roots; common fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine and medium faint grayish brown (2.5Y 5/2) iron depletions throughout; 1 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.
Bg2—21 to 30 inches; dark gray (2.5Y 4/1) loam; weak medium subangular blocky structure; friable; few very fine roots; common fine strong brown (7.5YR 4/6) very weakly cemented iron oxide concretions throughout; black (2.5Y 2.5/1) krotovina; many medium and coarse faint dark grayish brown (2.5Y 4/2) and gray (2.5Y 5/1) iron depletions throughout; common fine and medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation throughout; 4 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.
Bg3—30 to 38 inches; grayish brown (2.5Y 5/2) loam; weak medium subangular blocky structure; friable; few very fine roots; many fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation throughout; 4 percent gravel; strongly effervescent; slightly alkaline; gradual wavy boundary.
BCg—38 to 47 inches; light brownish gray (2.5Y 6/2) loam; weak medium and coarse subangular blocky structure; friable; many medium and coarse prominent dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; 7 percent gravel; strongly effervescent; slightly alkaline; clear wavy boundary.
Cg—47 to 60 inches; 45 percent light brownish gray (2.5Y 6/2), 40 percent brown (7.5YR 5/3), and 15 percent grayish brown (2.5Y 5/2), stratified loam, sandy loam, and loamy coarse sand; massive; very friable; 14 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: Less than 10 inches
Thickness of the solum: 30 to 50 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—loam

Bg or BCg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6

Chroma—0 to 2
Texture—loam, silt loam, clay loam, or sandy loam
Content of gravel—less than 10 percent

Cg horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 3
Texture—loam, silt loam, or sandy loam with strata of coarser textures
Content of gravel—2 to 15 percent

626A—Kish loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains, stream terraces, and ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Kish and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner subsurface layer than that of the Kish soil
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have less sand and more silt in the upper two-thirds of the profile than the Kish soil

Dissimilar soils:
- The somewhat poorly drained Elliott and Mundelein soils on footslopes and summits
- The very poorly drained Lena soils on toeslopes
- The poorly drained, noncalcareous Pella soils on toeslopes

Properties and Qualities of the Kish Soil

Parent material: Calcareous outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.2 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w

Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

830—Landfills

- This map unit consists of garbage and other refuse and rubble from the demolition of buildings and pavement, typically covered by a layer of compacted earth. Some of the landfills are active, but some have been abandoned.

Map Unit Composition

Landfills: 90 percent
Dissimilar components: 10 percent

Minor Components

Dissimilar components:
- The well drained, loamy Orthents on summits and backslopes
- The moderately well drained, clayey Orthents on summits and backslopes

Lena Series

Drainage class: Very poorly drained
Permeability: Moderately rapid
Landform: Ground moraines, end moraines, and outwash plains
Parent material: Herbaceous organic material
Slope range: 0 to 2 percent
Taxonomic classification: Euic, mesic Typic Haplosaprists

Typical Pedon

Lena muck, undrained, 0 to 2 percent slopes; at an elevation of 855 feet; 300 feet north and 1,400 feet west of the southeast corner of sec. 31, T. 45 N., R. 6 E., in McHenry County, Illinois; USGS Marengo North topographic quadrangle; lat. 42 degrees 19 minutes 42 seconds N. and long. 88 degrees 34 minutes 29 seconds W., NAD 27:

Oa1—0 to 11 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed, black (10YR 2/1) dry; about 10 percent fiber, less than 2 percent rubbed; weak medium subangular blocky structure parting to weak medium granular; very friable; many very fine roots; 2 percent fine snail-shell fragments; violently effervescent; moderately alkaline; gradual smooth boundary.

Oa2—11 to 27 inches; muck (sapric material), 50 percent black (N 2.5/0) and 50 percent black (10YR 2/1) broken face and rubbed; about 20 percent fiber, less than 2 percent rubbed; weak medium subangular blocky structure; friable; common very fine roots; 1 percent fine snail-shell fragments; slightly effervescent; slightly alkaline; gradual smooth boundary.

Oa3—27 to 60 inches; muck (sapric material), black (N 2.5/0) broken face and rubbed; about 5 percent fiber, less than 1 percent rubbed; massive; very friable; common very fine roots; 1 percent fine snail-shell fragments; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the organic deposits: More than 51 inches
Depth to carbonates: Less than 10 inches

Surface tier:
Hue—10YR or N
Value—2 to 3
Chroma—0 or 1

Subsurface tier:
Hue—7.5YR, 10YR, or N
Value—2 to 3
Chroma—0 to 2

1210A—Lena muck, undrained, 0 to 2 percent slopes

Setting

Landform: Ground moraines, outwash plains, and end moraines
Position on the landform: Toeslopes

Map Unit Composition

Lena and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have organic deposits less than 51 inches thick
- Soils that have less organic matter in the surface layer than the Lena soil

Dissimilar soils:
- The poorly drained Harpster and Pella soils on toeslopes
- The very poorly drained, noncalcareous Houghton soils on toeslopes

Properties and Qualities of the Lena Soil

Parent material: Herbaceous organic material
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 23.9 inches
Content of organic matter in the surface layer: 60 to 99 percent
Shrink-swell potential: Not rated
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through December
Ponding depth: 0 to 1 foot, January through December
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: High

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

Lorenzo Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains, end moraines, and kames
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Slope range: 4 to 6 percent
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Argiudolls

Typical Pedon

Lorenzo loam, 2 to 4 percent slopes; at an elevation of 905 feet; 1,800 feet north and 960 feet west of the southeast corner of sec. 18, T. 43 N., R. 6 E., in McHenry County, Illinois; USGS Marengo South topographic quadrangle; lat. 42 degrees 12 minutes 07 seconds N. and long. 88 degrees 34 minutes 25 seconds W., NAD 27:

Ap—0 to 8 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to weak fine and medium granular; friable; common very fine roots; 1 percent gravel; slightly acid; abrupt smooth boundary.
Bt1—8 to 12 inches; 95 percent dark yellowish brown (10YR 4/4) and 5 percent very dark brown (10YR 2/2) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3) clay films on faces of peds; 5 percent gravel; neutral; clear smooth boundary.
Bt2—12 to 18 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak medium subangular blocky structure; friable; common very fine roots; few distinct dark yellowish brown (10YR 3/4) and dark brown (10YR 3/3) clay films on faces of peds; 8 percent gravel; slightly acid; abrupt smooth boundary.
2C—18 to 60 inches; dark yellowish brown (10YR 4/4) very gravelly loamy sand and very gravelly sand; single grain; loose; common very fine roots; 32 percent gravel and 5 percent cobbles; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 6 to 15 inches
Depth to sandy and gravelly glaciofluvial deposits: 10 to 24 inches
Depth to carbonates: 12 to 24 inches
Thickness of the solum: 12 to 24 inches

Ap or A horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—1 or 2
Texture—loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, loam, or sandy clay loam or the gravelly analogs of these textures
Content of gravel—2 to 35 percent

2C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—20 to 75 percent

318C2—Lorenzo loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains, end moraines, and kames
Position on the landform: Backslopes and shoulders

Map Unit Composition

Lorenzo and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a lighter colored surface layer than that of the Lorenzo soil
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 24 inches
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The excessively drained Rodman soils on shoulders and backslopes
- The somewhat poorly drained Grundelein soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Lorenzo Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.1 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Markham Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 12 percent
Taxonomic classification: Fine, illitic, mesic Mollic Oxyaquic Hapludalfs

Typical Pedon

Markham silt loam, 2 to 4 percent slopes; at an elevation of 775 feet; 2,125 feet south and 1,375 feet east of the northwest corner of sec. 16, T. 40 N., R. 9 E., in Du Page County, Illinois; USGS West Chicago topographic quadrangle; lat. 41 degrees 57 seconds 11 minutes N. and long. 88 degrees 13 minutes 08 seconds W., NAD 27:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine roots; moderately acid; clear smooth boundary.

A—5 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; moderately acid; abrupt smooth boundary.

BA—8 to 12 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; moderately acid; clear wavy boundary.

2Bt1—12 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; friable; common very fine and fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common distinct brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 4/6) very weakly cemented iron oxide concretions throughout; 2 percent gravel; slightly acid; clear wavy boundary.

2Bt2—21 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium subangular blocky structure; friable; common very fine and fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and in pores; common fine yellowish red (5YR 4/6) very weakly cemented iron oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; 7 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

2BC—26 to 32 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium and coarse angular blocky structure; firm; common very fine roots; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; slightly alkaline; gradual wavy boundary.

2Cd1—32 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; few very fine roots; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; 6 percent gravel; violently effervescent; moderately alkaline; gradual wavy boundary.

2Cd2—39 to 60 inches; brown (10YR 5/3) silty clay loam; massive; very firm; common fine yellowish red (5YR 5/6) very weakly cemented iron oxide concretions throughout; 7 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 18 inches
Depth to carbonates: 18 to 42 inches
Thickness of the solum: 20 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Bt, 2Bt, or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 8
Texture—silty clay loam or silty clay
Content of gravel—less than 10 percent

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or clay loam
Content of gravel—less than 10 percent

531B—Markham silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Markham and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Markham soil
- Soils that have a thicker dark surface layer than that of the Markham soil
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a lighter colored surface layer than that of the Markham soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material
Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April

Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

531C2—Markham silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Markham and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have less clay and more sand or silt in the subsoil than the Markham soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have a lighter colored surface layer than that of the Markham soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Beecher soils on footslopes and summits
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material
Available water capacity to a depth of 60 inches: About 7.6 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High

Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

531D2—Markham silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Markham and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have less clay and more sand or silt in the subsoil than the Markham soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that have a lighter colored surface layer than that of the Markham soil

Dissimilar soils:
- The somewhat poorly drained Beecher soils on footslopes and summits
- The moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material
Available water capacity to a depth of 60 inches: About 7.6 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e

Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

979A—Grays and Markham silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits

Map Unit Composition

Grays and similar soils: 45 percent
Markham and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Grays and Markham soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays and Markham soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material

Available water capacity to a depth of 60 inches: About 8.3 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Grays—1; Markham—2s
Prime farmland status: Prime farmland
Hydric soil status: Grays—not hydric; Markham—not hydric

979B—Grays and Markham silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Grays and similar soils: 45 percent
Markham and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker surface layer than that of the Grays and Markham soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have a lighter colored surface layer than that of the Grays and Markham soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Grays Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate

Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Markham Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 55 inches to dense material
Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Grays—2e; Markham—2e
Prime farmland status: Prime farmland
Hydric soil status: Grays—not hydric; Markham—not hydric

Martinsville Series

Drainage class: Well drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Thin mantle of loess or other silty material and the underlying outwash
Slope range: 2 to 6 percent
Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Martinsville silt loam, 2 to 4 percent slopes; at an elevation of 942 feet; 375 feet south and 2,500 feet east of the northwest corner of sec. 15, T. 42 N., R. 7 E., in Kane County, Illinois; USGS Pingree Grove topographic quadrangle; lat. 42 degrees 07 minutes 27 seconds N. and long. 88 degrees 24 minutes 15 seconds W., NAD 27:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine and fine roots; 1 percent gravel; slightly acid; abrupt smooth boundary.

E1—5 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; moderate thick platy structure; very friable; many very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; 1 percent gravel; slightly acid; clear smooth boundary.

E2—8 to 12 inches; brown (10YR 4/3) sandy loam; moderate thick platy structure; friable; common very fine and fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in pores; 1 percent gravel; slightly acid; clear smooth boundary.

BE—12 to 17 inches; dark yellowish brown (10YR 4/4) loam; weak thin and medium platy structure parting to weak fine subangular blocky; friable; common very fine and fine roots; 1 percent gravel; slightly acid; clear wavy boundary.

Bt1—17 to 22 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; 1 percent gravel; slightly acid; clear wavy boundary.

Bt2—22 to 28 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; 1 percent gravel; slightly acid; clear wavy boundary.

Bt3—28 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and in pores; common fine and medium black (N 2.5/0) very weakly cemented iron and manganese oxide concretions throughout; 1 percent gravel; moderately acid; clear wavy boundary.

Bt4—38 to 53 inches; yellowish brown (10YR 5/4) sandy clay loam; weak fine and medium subangular blocky structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds and in pores; few distinct light gray (10YR 7/2) (dry) clay depletions on faces of peds; common fine and medium black (N 2.5/0) very weakly cemented iron and manganese oxide concretions throughout; 1 percent gravel; moderately acid; clear wavy boundary.

C—53 to 60 inches; yellowish brown (10YR 5/4), stratified loam and sandy loam; massive; friable; common distinct light gray (10YR 7/2) (dry) clay depletions along cleavage planes; common fine and medium black (N 2.5/0) very weakly cemented iron and manganese oxide concretions throughout; 1 percent gravel; slightly acid.

Range in Characteristics

Thickness of the loess or other silty material: Less than 20 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to 70 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam

E horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—2 to 4
Texture—loam, silt loam, sandy loam, or fine sandy loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, sandy clay loam, silt loam, or sandy loam
Content of gravel—less than 10 percent

C horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—stratified sand to silt loam
Content of gravel—less than 10 percent

570B—Martinsville silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Martinsville and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Martinsville soil
- Soils that have slopes of less than 2 percent
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The well drained Fox soils, which are moderately deep to sandy and gravelly glaciofluvial deposits; on summits and backslopes
- Somewhat poorly drained, loamy soils on footslopes and summits
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Martinsville Soil

Parent material: Thin mantle of loess or other silty material and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.4 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

570C2—Martinsville silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and shoulders

Map Unit Composition

Martinsville and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Martinsville soil
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have a seasonal high water table at a depth of less than 6 feet

Dissimilar soils:
- The well drained Fox soils, which are moderately deep to sandy and gravelly glaciofluvial deposits; on shoulders and backslopes
- Somewhat poorly drained, loamy soils on footslopes and summits
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Martinsville Soil

Parent material: Thin mantle of loess or other silty material and the underlying outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.2 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Martinton Series

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits

Slope range: 0 to 4 percent
Taxonomic classification: Fine, illitic, mesic Aquic Argiudolls

Typical Pedon

Martinton silt loam, 0 to 2 percent slopes; at an elevation of 650 feet; 425 feet north and 160 feet west of the southeast corner of sec. 5, T. 27 N., R. 7 E., in Livingston County, Illinois; USGS Forrest North topographic quadrangle; lat. 40 degrees 50 minutes 01 second N. and long. 88 degrees 26 minutes 03 seconds W., NAD 27:

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine roots; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

BA—12 to 19 inches; brown (10YR 4/3) silty clay loam; moderate fine angular blocky structure; friable; few very fine roots; many faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg1—19 to 27 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common distinct very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; slightly acid; clear smooth boundary.

Btg2—27 to 39 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; firm; few very fine roots; common faint very dark grayish brown (2.5Y 3/2) organo-clay films on faces of peds; few black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; many medium distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

BCtg—39 to 46 inches; grayish brown (2.5Y 5/2) silt loam; weak medium prismatic structure; friable; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

Cg—46 to 60 inches; 60 percent grayish brown (2.5Y 5/2) and 40 percent yellowish brown (10YR 5/6), stratified silty clay loam and sandy loam; massive; friable; few fine black (7.5YR 2.5/1) iron and manganese oxide concretions throughout; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 24 to 50 inches
Thickness of the solum: 30 to 52 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3

Chroma—1 or 2
Texture—silt loam

Btg or Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, loam, or sandy loam

189A—Martinton silt loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Summits and footslopes

Map Unit Composition

Martinton and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that have slopes of more than 2 percent
- Soils that have till in the lower part of the profile
- Soils that have less clay and more silt in the subsoil than the Martinton soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Martinton Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.6 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

189B—Martinton silt loam, 2 to 4 percent slopes

Setting

Landform: Lake plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Martinton and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that do not have a subsurface layer
- Soils that have slopes of less than 2 percent
- Soils that have till in the lower part of the profile
- Soils that have less clay and more silt in the subsoil than the Martinton soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Martinton Soil

Parent material: Lacustrine deposits
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.5 inches
Content of organic matter in the surface layer: 4 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Millbrook Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs

Typical Pedon

Millbrook silt loam, 0 to 2 percent slopes; at an elevation of 830 feet; 150 feet south and 1,390 feet east of the northwest corner of sec. 12, T. 42 N., R. 5 E., in De Kalb County, Illinois; USGS Marengo South topographic quadrangle; lat. 42 degrees 08 minutes 17 seconds N. and long. 88 degrees 36 minutes 09 seconds W., NAD 27:

Ap—0 to 8 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine granular structure; friable; common very fine roots; moderately acid; abrupt smooth boundary.

E—8 to 12 inches; 70 percent dark grayish brown (10YR 4/2) and 30 percent brown (10YR 4/3) silt loam, grayish brown (10YR 5/2) dry; weak thin platy structure parting to moderate fine granular; friable; common very fine roots; moderately acid; clear smooth boundary.

Bt1—12 to 18 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear smooth boundary.

Bt2—18 to 26 inches; grayish brown (10YR 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few distinct very dark brown (10YR 2/2) organic coatings in root channels and in pores; few fine very dark grayish brown (10YR 3/2) iron and manganese oxide concretions throughout; many fine and medium faint brown (10YR 5/3) and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear smooth boundary.

2Bt3—26 to 34 inches; grayish brown (10YR 5/2) loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine very dark brown (10YR 2/2) iron and manganese oxide concretions throughout; many fine and medium prominent yellowish brown (10YR 5/6) and common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

2Bt4—34 to 41 inches; dark grayish brown (10YR 4/2) sandy loam; weak coarse subangular blocky structure; very friable; few very fine roots; few distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine very dark brown (10YR 2/2) iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

2C1—41 to 57 inches; stratified light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6 and 5/8) loam and sandy loam and gray (5Y 6/1) silt loam; massive; very friable; common fine very dark brown (10YR 2/2) iron and manganese oxide concretions throughout; 3 percent gravel; neutral; clear wavy boundary.

2C2—57 to 65 inches; stratified light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6 and 5/8) loam and sandy loam and gray (5Y 6/1) silt loam; massive;

very friable; few fine very dark brown (10YR 2/2) iron and manganese oxide concretions throughout; 4 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 24 to 40 inches
Depth to carbonates: More than 40 inches
Thickness of the solum: 40 to 65 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—sandy loam, loam, silt loam, clay loam, or sandy clay loam
Content of gravel—less than 10 percent

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 8
Texture—stratified sandy loam, loam, silt loam, clay loam, or loamy sand
Content of gravel—less than 15 percent

219A—Millbrook silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes and summits

Map Unit Composition

Millbrook and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a darker subsurface layer than that of the Millbrook soil

- Soils that have carbonates at a depth of less than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Millbrook Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

Millington Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Calcareous alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Cumulic Endoaquolls

Typical Pedon

Millington silt loam, 0 to 2 percent slopes, occasionally flooded; at an elevation of 650 feet; 580 feet north and 509 feet east of the southwest corner of sec. 27, T. 39 N., R. 8 E., in Kane County, Illinois; USGS Aurora North topographic quadrangle; lat. 41 degrees 49 minutes 34 seconds N. and long. 88 degrees 19 minutes 12 seconds W., NAD 27:

A1—0 to 12 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate fine and medium granular structure; friable; common very fine roots; strongly effervescent; moderately alkaline; gradual wavy boundary.

A2—12 to 21 inches; very dark gray (10YR 3/1) silt loam containing about 20 percent sand; gray (10YR 5/1) dry; weak medium subangular blocky structure parting to weak medium granular; friable; common very fine and fine roots; 3 percent snail shells and 5 percent snail-shell fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

AB—21 to 26 inches; very dark grayish brown (2.5Y 3/2) silt loam containing about 25 percent sand; grayish brown (2.5Y 5/2) dry; weak fine and medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; few distinct very dark gray (10YR 3/1) organic coatings in root channels and pores; 2 percent snail shells and 6 percent snail-shell fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bg1—26 to 36 inches; very dark grayish brown (2.5Y 4/2) loam; weak fine subangular blocky structure; friable; common very fine roots; few distinct very dark grayish brown (2.5Y 3/2) organic coatings in root channels and pores; 2 percent snail shells and 4 percent snail-shell fragments; common fine prominent dark yellowish brown (10YR 4/6) iron concretions throughout; strongly effervescent; moderately alkaline; gradual wavy boundary.

Bg2—36 to 49 inches; dark grayish brown (2.5Y 4/2), stratified silt loam and sandy loam; weak medium subangular blocky structure; friable; common very fine roots; few distinct very dark grayish brown (2.5Y 3/2) organic coatings in root channels and pores; 2 percent snail shells and 3 percent snail-shell fragments; many fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

Cg1—49 to 57 inches; black (2.5Y 2.5/1), stratified silt loam and sandy loam; massive; friable; few very fine roots; 2 percent snail shells and 3 percent snail-shell fragments; few fine distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

Cg2—57 to 62 inches; dark gray (2.5Y 4/1) sandy loam; massive; friable; 14 percent gravel; slightly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 40 inches
Depth to carbonates: Less than 10 inches
Thickness of the solum: 24 to 48 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silt loam; silt loam or loam in the lower part

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 5
Chroma—0 to 2
Texture—loam, silt loam, clay loam, or silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 6
Chroma—0 to 2
Texture—loam, silt loam, sandy loam, or clay loam
Content of gravel—less than 15 percent

1082A—Millington silt loam, undrained, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Millington and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less sand and more silt in the upper one-half of the profile than the Millington soil
- Soils that have more gravel in the lower part of the profile than the Millington soil
- Soils that have a lighter colored subsoil than that of the Millington soil

Dissimilar soils:
- The very poorly drained Lena soils on toeslopes of adjacent landforms
- The poorly drained, noncalcareous Sawmill soils on flood plains

Properties and Qualities of the Millington Soil

Parent material: Calcareous alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 11.5 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, November through June
Ponding depth: 0 to 0.5 foot, November through June
Frequency and most likely period of flooding: Occasional, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

8082A—Millington silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Millington and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less sand and more silt in the upper one-half of the profile than the Millington soil

- Soils that have more gravel in the lower part of the profile than the Millington soil
- Soils that have a lighter colored subsoil than that of the Millington soil

Dissimilar soils:
- The poorly drained, noncalcareous Sawmill soils on flood plains

Properties and Qualities of the Millington Soil

Parent material: Calcareous alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 11.7 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Frequency and most likely period of flooding: Occasional, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Millstream Series

Drainage class: Somewhat poorly drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquollic Hapludalfs

Typical Pedon

Millstream silt loam, 0 to 2 percent slopes; at an elevation of 862 feet; 5 feet north and 1,600 feet west of the southeast corner of sec. 32, T. 45 N., R. 6 E., in McHenry County, Illinois; USGS Marengo North topographic quadrangle; lat. 42 degrees 19 minutes 39 seconds N. and long. 88 degrees 33 minutes 22 seconds W., NAD 27:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak very fine and fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
E—8 to 14 inches; brown (10YR 5/3) silt loam; weak medium platy structure parting to weak fine granular; friable; common very fine roots; common fine dark brown (7.5YR 3/2) very weakly cemented iron and manganese oxide concretions throughout; moderately acid; clear smooth boundary.
Bt1—14 to 21 inches; brown (10YR 5/3) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; many distinct brown (10YR 4/3)

and few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; common fine dark brown (7.5YR 3/2) very weakly cemented iron and manganese oxide concretions throughout; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; moderately acid; clear smooth boundary.

Bt2—21 to 27 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; common fine dark brown (7.5YR 3/2) very weakly cemented iron and manganese oxide concretions throughout; many fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; clear wavy boundary.

2Bt3—27 to 34 inches; grayish brown (10YR 5/2) sandy clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; few distinct dark grayish brown (10YR 4/2) clay films and very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; 3 percent gravel; strongly acid; clear wavy boundary.

2Bt4—34 to 43 inches; brown (10YR 4/3) sandy loam; weak medium and coarse subangular blocky structure; very friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds and in pores; many coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; many medium and coarse faint brown (10YR 5/3) iron depletions in the matrix; 3 percent gravel; slightly acid; clear wavy boundary.

2Bt5—43 to 47 inches; 60 percent dark yellowish brown (10YR 4/6) and 40 percent dark brown (10YR 3/3) sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; 12 percent gravel; neutral; clear wavy boundary.

3C—47 to 60 inches; brown (10YR 5/3) gravelly loamy sand and gravelly sand; single grain; loose; few very fine roots; 25 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 24 to 45 inches
Depth to sandy and gravelly outwash: 32 to 50 inches
Depth to carbonates: 30 to 50 inches
Thickness of the solum: 36 to 50 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6

Chroma—2 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—clay loam, loam, sandy loam, or sandy clay loam or the gravelly analogs of these textures
Content of gravel—0 to 25 percent

3C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—15 to 70 percent

557A—Millstream silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Footslopes and summits

Map Unit Composition

Millstream and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a lighter colored surface layer than that of the Millstream soil
- Soils that have a darker subsurface layer than that of the Millstream soil
- Soils that have less silt and more sand in the upper one-half of the profile than the Millstream soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 32 inches or more than 50 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The well drained Bowes and Rush soils on summits
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Millstream Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.1 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May

Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Montgomery Series

Drainage class: Poorly drained
Permeability: Slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 0 to 2 percent
Taxonomic classification: Fine, mixed, active, mesic Vertic Endoaquolls

Typical Pedon

Montgomery silty clay loam, 0 to 2 percent slopes; at an elevation of 657 feet; 1,845 feet south and 150 feet east of the northwest corner of sec. 10, T. 44 N., R. 11 E., in Lake County, Illinois; USGS Libertyville topographic quadrangle; lat. 42 degrees 18 minutes 30 seconds N. and long. 87 degrees 56 minutes 37 seconds W., NAD 27:

Ap—0 to 10 inches; black (10YR 2/1) silty clay loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure parting to moderate medium granular; friable; common very fine and fine roots; neutral; clear smooth boundary.

A—10 to 18 inches; black (10YR 2/1) silty clay loam, dark grayish brown (10YR 4/2) dry; weak medium angular blocky structure; firm; common very fine and fine roots; common fine distinct dark brown (10YR 3/3) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg—18 to 22 inches; dark grayish brown (2.5Y 4/2) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; common fine faint brown (10YR 4/3) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Btg1—22 to 29 inches; dark grayish brown (2.5Y 4/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; common distinct dark gray (2.5Y 4/1) clay films on faces of peds; few distinct black (10YR 2/1) organo-clay films on faces of peds and in pores; common fine and medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; common fine and medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; neutral; gradual smooth boundary.

Btg2—29 to 34 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct dark gray (2.5Y 4/1) clay films on faces of peds; very few distinct black (10YR 2/1) organo-clay films on faces of peds and in pores; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint dark grayish brown (2.5Y 4/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.

Btg3—34 to 40 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium and coarse subangular blocky structure; firm; few very fine roots; few distinct very dark gray (2.5Y 3/1) clay films on faces of peds and in pores; few distinct dark gray (2.5Y 4/1) clay films on faces of peds; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium and coarse faint dark grayish brown (2.5Y 4/2) iron depletions in the matrix; 3 percent gravel; neutral; clear smooth boundary.

BCg—40 to 48 inches; gray (5Y 5/1) silty clay; weak medium and coarse subangular blocky structure; firm; few very fine roots; few distinct very dark gray (2.5Y 3/1) clay films on faces of peds and in pores; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium and coarse faint dark gray (5Y 4/1) iron depletions in the matrix; 1 percent gravel; slightly alkaline; gradual smooth boundary.

Cg—48 to 60 inches; olive gray (5Y 5/2) silty clay loam; massive; firm; few very fine roots; very few distinct very dark gray (2.5Y 3/1) coatings in root channels and/or pores; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium and coarse faint gray (5Y 5/1) iron depletions in the matrix; 1 percent gravel; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 20 to 50 inches
Thickness of the solum: 24 to 55 inches

Ap or A horizon:
Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—silty clay loam

Bg or Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay or silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam or silty clay

465A—Montgomery silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains
Position on the landform: Toeslopes

Map Unit Composition

Montgomery and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Montgomery soil

- Soils that have till in the lower part of the profile
- Soils that have a thicker surface soil than that of the Montgomery soil

Dissimilar soils:

- The somewhat poorly drained Frankfort and Nappanee soils on summits and footslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Montgomery Soil

Parent material: Lacustrine deposits
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.4 inches
Content of organic matter in the surface layer: 3 to 6 percent
Shrink-swell potential: High
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Mundelein Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Argiudolls

Typical Pedon

Mundelein silt loam, 0 to 2 percent slopes; at an elevation of 778 feet; 2,289 feet north and 2,430 feet west of the southeast corner of sec. 14, T. 45 N., R. 10 E., in Lake County, Illinois; USGS Antioch topographic quadrangle; lat. 42 degrees 22 minutes 39 seconds N. and long. 88 degrees 01 minute 59 seconds W., NAD 27:

Ap—0 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak fine granular; friable; common very fine roots; slightly acid; clear smooth boundary.

A—7 to 13 inches; black (N 2.5/0) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to weak fine granular; friable; common very fine roots; neutral; clear smooth boundary.

AB—13 to 17 inches; very dark brown (10YR 2/2) silt loam, dark grayish brown (10YR 4/2) dry; weak very fine and fine subangular blocky structure parting to weak fine granular; friable; few very fine roots; many distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—17 to 21 inches; brown (10YR 4/3) silty clay loam; moderate very fine and fine subangular blocky structure; friable; few distinct black (10YR 2/1) organic coatings on faces of peds; few distinct very dark grayish brown (10YR 3/2) organo-clay films and dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—21 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) and brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent gravel; neutral; clear smooth boundary.

Bt3—26 to 31 inches; light olive brown (2.5Y 5/4) silt loam; weak medium subangular blocky structure; friable; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; 4 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—31 to 42 inches; 65 percent yellowish brown (10YR 5/4 and 5/6) and 35 percent light brownish gray (2.5Y 6/2), stratified silt loam and loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 8 percent gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

2C—42 to 60 inches; 35 percent light brown (7.5YR 6/3), 35 percent yellowish brown (10YR 5/6), and 30 percent light brownish gray (2.5Y 6/2), stratified loam and silt loam; massive; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 6 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess or other silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 50 inches

Ap, A, or AB horizon:
Hue—10YR
Value—2 to 3
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, loam, clay loam, sandy clay loam, or sandy loam
Content of gravel—less than 10 percent

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—stratified silt loam to fine sand
Content of gravel—less than 15 percent

442A—Mundelein silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

Map Unit Composition

Mundelein and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that do not have a subsurface layer

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

442B—Mundelein silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and footslopes

Map Unit Composition

Mundelein and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have slopes of less than 2 percent
- Soils that do not have a subsurface layer

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.5 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

989A—Mundelein and Elliott silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and footslopes

Map Unit Composition

Mundelein and similar soils: 45 percent
Elliott and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner subsurface layer than that of the Mundelein and Elliott soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.3 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Mundelein—1; Elliott—2w
Prime farmland status: Prime farmland
Hydric soil status: Mundelein—not hydric; Elliott—not hydric

989B—Mundelein and Elliott silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Mundelein and similar soils: 45 percent
Elliott and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner subsurface layer than that of the Mundelein and Elliott soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Mundelein Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.5 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Elliott Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material

Available water capacity to a depth of 60 inches: About 8 inches
Content of organic matter in the surface layer: 3.5 to 5.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Mundelein—2e; Elliott—2e
Prime farmland status: Prime farmland
Hydric soil status: Mundelein—not hydric; Elliott—not hydric

Nappanee Series

Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 0 to 6 percent
Taxonomic classification: Fine, illitic, mesic Aeric Epiaqualfs

Typical Pedon

Nappanee silt loam, 2 to 4 percent slopes; at an elevation of 665 feet; 1,220 feet south and 500 feet east of the northwest corner of sec. 10, T. 44 N., R. 11 E., in Lake County, Illinois; USGS Libertyville topographic quadrangle; lat. 42 degrees 18 minutes 34 seconds N. and long. 87 degrees 56 minutes 33 seconds W., NAD 27:

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 6/1) dry; weak very fine and fine granular structure; friable; many very fine and fine roots; neutral; abrupt smooth boundary.
E—4 to 9 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; weak thick platy structure; friable; many very fine and fine roots; neutral; clear smooth boundary.
Bt1—9 to 19 inches; dark grayish brown (10YR 4/2) silty clay; moderate fine and medium subangular blocky structure; firm; common very fine roots; common prominent very dark gray (10YR 3/1) organo-clay films on faces of peds and in pores; common fine and medium prominent dark yellowish brown (10YR 4/6) weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) strongly cemented manganese oxide nodules throughout; 1 percent gravel; slightly alkaline; clear smooth boundary.
Bt2—19 to 23 inches; brown (10YR 4/3) silty clay; moderate medium subangular blocky structure; firm; common very fine roots; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct gray (10YR 5/1) iron depletions in the matrix; 3 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
Bt3—23 to 28 inches; brown (10YR 5/3) silty clay; weak medium prismatic structure parting to moderate medium subangular blocky; very firm; common very fine roots;

many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 3 percent gravel; slightly effervescent; moderately alkaline; gradual smooth boundary.

Btk1—28 to 36 inches; brown (10YR 5/3) silty clay; weak medium prismatic structure parting to weak medium subangular blocky; very firm; common very fine roots; common distinct dark grayish brown (2.5Y 4/2) and grayish brown (2.5Y 5/2) clay films on faces of peds and in pores; common distinct dark brown (7.5YR 3/2) organo-clay films on surfaces along pores; many fine and medium pale yellow (2.5Y 8/2) carbonate concretions throughout; common medium and coarse prominent strong brown (7.5YR 5/6) and common medium and coarse faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; strongly effervescent; moderately alkaline; gradual smooth boundary.

Btk2—36 to 46 inches; yellowish brown (10YR 5/4) silty clay; weak medium prismatic structure parting to weak coarse subangular blocky; very firm; common very fine roots; common prominent pale yellow (2.5Y 8/2) carbonate coats on horizontal faces of peds; many prominent dark gray (2.5Y 4/1) and gray (2.5Y 5/1) clay films on all faces of peds; common prominent dark brown (7.5YR 3/2) organo-clay films on surfaces along pores; common fine and medium prominent strong brown (7.5YR 5/8) weakly cemented iron oxide concretions throughout; few fine black (7.5YR 2.5/1) strongly cemented manganese oxide concretions throughout; common fine and medium pale yellow (2.5Y 8/2) carbonate concretions throughout; common fine and medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd—46 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; massive; very firm; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine black (7.5YR 2.5/1) strongly cemented manganese oxide concretions throughout; common medium pale yellow (2.5Y 8/2) carbonate concretions throughout; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 20 inches
Depth to carbonates: 18 to 40 inches
Thickness of the solum: 24 to 60 inches

A or Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—1 to 3
Texture—silt loam or silty clay loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—1 or 2
Texture—silt loam

Bt or Btk horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4

Texture—silty clay or clay
Content of gravel—less than 5 percent

Cd horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay, clay, or silty clay loam
Content of gravel—less than 5 percent

228A—Nappanee silt loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Summits and footslopes

Map Unit Composition

Nappanee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Nappanee soil
- Soils that have slopes of more than 2 percent
- Soils that have a darker surface layer and subsurface layer than those of the Nappanee soil

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6.1 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

228B—Nappanee silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Nappanee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Nappanee soil
- Soils that have slopes of less than 2 percent
- Soils that have a darker surface layer and subsurface layer than those of the Nappanee soil
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

228B2—Nappanee silty clay loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and footslopes

Map Unit Composition

Nappanee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Nappanee soil
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are only slightly eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

228C2—Nappanee silty clay loam, 4 to 6 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Nappanee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more silt in the subsoil than the Nappanee soil

- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are severely eroded

Dissimilar soils:
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 4.5 inches
Content of organic matter in the surface layer: 1.0 to 2.5 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Very high
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

982A—Aptakisic and Nappanee silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Footslopes and summits

Map Unit Composition

Aptakisic and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Aptakisic and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Aptakisic Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6.1 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Aptakisic—2w; Nappanee—3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Aptakisic—not hydric; Nappanee—not hydric

982B—Aptakisic and Nappanee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Aptakisic and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Aptakisic and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Aptakisic Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Aptakisic—2e; Nappanee—3e
Prime farmland status: Prime farmland
Hydric soil status: Aptakisic—not hydric; Nappanee—not hydric

983B—Zurich and Nappanee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Zurich—summits and backslopes; Nappanee—backslopes and footslopes

Map Unit Composition

Zurich and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Zurich and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till

Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—2e; Nappanee—3e
Prime farmland status: Prime farmland
Hydric soil status: Zurich—not hydric; Nappanee—not hydric

802B—Orthents, loamy, undulating

Setting

Landform: Ground moraines, leveled land, and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Orthents, loamy, and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have less sand and more silt in the profile than the Orthents
- Soils that have a seasonal high water table at a depth of less than 3.5 feet
- Soils that have carbonates at or near the surface
- Soils that have more than 15 percent gravel in the profile
- Soils that have slopes of more than 6 percent

Dissimilar soils:
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Orthents

Parent material: Earthy fill
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.8 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 3.5 to 5.0 feet, February through April

Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

805B—Orthents, clayey, undulating

Setting

Landform: Ground moraines, leveled land, and lake plains
Position on the landform: Summits and backslopes

Map Unit Composition

Orthents, clayey, and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have less clay and more sand or silt in the profile than the Orthents
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have carbonates at or near the surface
- Soils that have slopes of more than 6 percent

Dissimilar soils:
- The poorly drained Ashkum soils on toeslopes
- The very poorly drained Houghton and Peotone soils on toeslopes

Properties and Qualities of the Orthents

Parent material: Earthy fill
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.4 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: High
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Very high
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Ozaukee Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 30 percent
Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs

Typical Pedon

Ozaukee silt loam, 2 to 4 percent slopes; at an elevation of 780 feet; 2,540 feet north and 2,200 feet east of the southwest corner of sec. 31, T. 39 N., R. 10 E., in Du Page County, Illinois; USGS Naperville topographic quadrangle; lat. 41 degrees 49 minutes 14 seconds N. and long. 88 degrees 08 minutes 18 seconds W., NAD 27:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, yellowish brown (10YR 5/4) dry; moderate very fine and fine granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

BE—4 to 10 inches; brown (10YR 4/3) silt loam; weak thick platy structure parting to moderate fine subangular blocky; friable; many very fine roots; few distinct dark grayish brown (10YR 4/2) coatings on faces of peds; moderately acid; clear smooth boundary.

2Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak fine prismatic structure parting to moderate fine subangular blocky; friable; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; many distinct brown (10YR 4/3) clay films on faces of peds; 1 percent gravel; slightly acid; abrupt smooth boundary.

2Bt2—16 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organo-clay films and brown (10YR 4/3) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent gravel; neutral; clear smooth boundary.

2Bt3—21 to 27 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 8 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2Bt4—27 to 33 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common very fine roots; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds;

common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 8 percent gravel; strongly effervescent; moderately alkaline; clear smooth boundary.

2BCt—33 to 39 inches; light olive brown (2.5Y 5/3) silty clay loam; weak fine and medium subangular blocky structure; firm; common very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine strong brown (7.5YR 5/8) very weakly cemented iron oxide concretions throughout; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concentrations throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2Cd—39 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; massive; firm; few very fine roots; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; many medium white (10YR 8/1) carbonate concretions throughout; many medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 6 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: Less than 18 inches
Depth to carbonates: 15 to 40 inches
Thickness of the solum: 20 to 45 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam or silty clay loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam, silty clay, or clay
Content of gravel—1 to 10 percent

2Cd horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 4
Texture—silty clay loam or clay loam
Content of gravel—3 to 15 percent

530B—Ozaukee silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a thicker, darker surface layer than that of the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.2 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

530B2—Ozaukee silt loam, 2 to 4 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

530C—Ozaukee silt loam, 4 to 6 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a thicker, darker surface layer than that of the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Blount soils on footslopes and summits
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.2 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

530C2—Ozaukee silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil

- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Blount soils on footslopes and summits
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.2 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

530C3—Ozaukee silty clay loam, 4 to 6 percent slopes, severely eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Ozaukee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.2 inches
Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530D—Ozaukee silt loam, 6 to 12 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a thicker, darker surface layer than that of the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 6 percent or more than 12 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits

- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.1 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530D2—Ozaukee silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 6 percent or more than 12 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow

Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.2 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530D3—Ozaukee silty clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 6 percent or more than 12 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.5 inches
Content of organic matter in the surface layer: 0.5 to 1.0 percent
Shrink-swell potential: Moderate

Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer is mostly subsoil material.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530E—Ozaukee silt loam, 12 to 20 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 12 percent or more than 20 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.1 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete

Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530E2—Ozaukee silt loam, 12 to 20 percent slopes, eroded

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are slightly eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 12 percent or more than 20 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.4 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 4e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

530F—Ozaukee silt loam, 20 to 30 percent slopes

Setting

Landform: End moraines and ground moraines
Position on the landform: Backslopes

Map Unit Composition

Ozaukee and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have less clay and more sand or silt in the subsoil than the Ozaukee soil
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 20 percent or more than 30 percent

Dissimilar soils:
- The somewhat poorly drained Blount soils on footslopes and summits
- Moderately well drained, calcareous soils on backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.7 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Very high
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 6e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

840B—Zurich and Ozaukee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and summits

Map Unit Composition

Zurich and similar soils: 45 percent
Ozaukee and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have a thicker dark surface layer than that of the Zurich and Ozaukee soils
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have lacustrine deposits in the lower part of the profile

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.2 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate

Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—2e; Ozaukee—2e
Prime farmland status: Prime farmland
Hydric soil status: Zurich—not hydric; Ozaukee—not hydric

840C2—Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Zurich and similar soils: 45 percent
Ozaukee and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have lacustrine deposits in the lower part of the profile

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Aptakisic and Blount soils on footslopes and summits
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.4 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.

Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.2 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—3e; Ozaukee—2e
Prime farmland status: Not prime farmland
Hydric soil status: Zurich—not hydric; Ozaukee—not hydric

Pella Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Outwash plains, lake plains, ground moraines, and end moraines
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Pella silty clay loam, 0 to 2 percent slopes; at an elevation of 658 feet; 190 feet north and 2,225 feet west of the southeast corner of sec. 14, T. 27 N., R. 9 E., in Ford County, Illinois; USGS Piper City topographic quadrangle; lat. 40 degrees 48 minutes 25 seconds N. and long. 88 degrees 09 minutes 14 seconds W., NAD 27:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (N 4/0) dry; moderate very fine and fine granular structure; friable; slightly acid; abrupt smooth boundary.
A—7 to 12 inches; black (N 2.5/0) silty clay loam, dark gray (N 4/0) dry; moderate fine and very fine granular structure; friable; neutral; clear smooth boundary.
Bg1—12 to 20 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine and very fine angular blocky; friable; few fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg2—20 to 27 inches; grayish brown (2.5Y 5/2) silty clay loam; weak fine and medium prismatic structure parting to moderate fine and medium angular blocky; friable; common medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

Bg3—27 to 33 inches; gray (5Y 6/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; friable; few very dark gray (10YR 3/1) krotovinas; many medium prominent light olive brown (2.5Y 5/4) and common fine prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline; gradual wavy boundary.

2BCg—33 to 42 inches; gray (5Y 6/1) silt loam with a high content of sand; weak medium prismatic structure; friable; moderate medium prominent light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly effervescent; moderately alkaline; gradual wavy boundary.

2Cg—42 to 60 inches; gray (5Y 6/1), stratified silt loam, loam, and sandy loam; massive; friable; many medium prominent light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Thickness of the loess or other silty material: 20 to 40 inches
Depth to carbonates: 16 to 40 inches
Thickness of the solum: 30 to 50 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam or silt loam

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam

2Bg or 2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 6
Texture—silt loam, sandy loam, silty clay loam, or clay loam
Content of gravel—1 to 10 percent

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 8
Texture—stratified loamy sand to silty clay loam
Content of gravel—less than 15 percent

153A—Pella silty clay loam, 0 to 2 percent slopes

Setting

Landform: Lake plains, ground moraines, and outwash plains
Position on the landform: Toeslopes

Map Unit Composition

Pella and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that are darker in the upper part of the subsoil than the Pella soil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Aptakisic, Mundelein, and Wauconda soils on summits and footslopes
- The poorly drained, calcareous Harpster soils on toeslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Pella Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 12 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

153A+—Pella silt loam, 0 to 2 percent slopes, overwash

Setting

Landform: Ground moraines, outwash plains, and end moraines
Position on the landform: Toeslopes

Map Unit Composition

Pella and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are deeper to carbonates than the Pella soil
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that are deeper to outwash than the Pella soil
- Soils that are darker in the upper part of the subsoil than the Pella soil

Dissimilar soils:
- The somewhat poorly drained Aptakisic, Mundelein, and Wauconda soils on summits and footslopes
- The poorly drained, calcareous Harpster soils on toeslopes
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Pella Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 13.3 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

Peotone Series

Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Ground moraines and end moraines
Parent material: Colluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Typical Pedon

Peotone silty clay loam, 0 to 2 percent slopes; at an elevation of 707 feet; 315 feet south and 2,233 feet east of the northwest corner of sec. 21, T. 29 N., R. 9 E., in Ford County, Illinois; USGS Cabery topographic quadrangle; lat. 40 degrees 58 minutes 49 seconds N. and long. 88 degrees 12 minutes 00 seconds W., NAD 27:

Ap—0 to 7 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
A—7 to 13 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg1—13 to 27 inches; black (N 2.5/0) silty clay loam, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; common very fine roots; neutral; clear smooth boundary.
Bg2—27 to 41 inches; dark gray (10YR 4/1) silty clay; moderate fine prismatic structure; firm; common very fine roots; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.
Bg3—41 to 50 inches; dark gray (10YR 4/1) silty clay; moderate medium prismatic structure; firm; few very fine roots; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly alkaline; clear smooth boundary.
Cg—50 to 60 inches; dark gray (10YR 4/1) silty clay loam; massive; firm; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine faint dark grayish brown (10YR 4/2) iron depletions in the matrix; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 28 inches
Thickness of the solum: 38 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 or 1
Texture—silty clay loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, silt loam, or silty clay

330A—Peotone silty clay loam, 0 to 2 percent slopes

Setting

Landform: Ground moraines
Position on the landform: Toeslopes

Map Unit Composition

Peotone and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are lighter colored in the upper one-half of the subsoil than the Peotone soil
- Soils that have less clay and more silt in the subsurface layer and subsoil than the Peotone soil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Elliott and Mundelein soils on summits and footslopes
- The very poorly drained, mucky Houghton soils on toeslopes

Properties and Qualities of the Peotone Soil

Parent material: Colluvium
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 5 to 7 percent
Shrink-swell potential: High
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through June
Ponding depth: 0 to 0.5 foot, January through June
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Hydric

1330A—Peotone silty clay loam, undrained, 0 to 2 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Toeslopes

Map Unit Composition

Peotone and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are lighter colored in the upper one-half of the subsoil than the Peotone soil

- Soils that have less clay and more silt in the subsurface layer and subsoil than the Peotone soil
- Soils that are overlain by recent, light-colored deposition

Dissimilar soils:
- The somewhat poorly drained Elliott and Mundelein soils on summits and footslopes
- The very poorly drained, mucky Houghton soils on toeslopes

Properties and Qualities of the Peotone Soil

Parent material: Colluvium
Drainage class: Very poorly drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.7 inches
Content of organic matter in the surface layer: 5 to 7 percent
Shrink-swell potential: High
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, January through December
Ponding depth: 0 to 1 foot, November through May; 0 to 0.5 foot, June through October
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Moderate

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

865—Pits, gravel

- This map unit consists of nearly level to gently sloping areas from which gravel has been extracted. The pits have nearly vertical sidewalls. Some pits are active, and others have been abandoned. Some contain water.

Map Unit Composition

Pits, gravel: 92 percent
Dissimilar components: 8 percent

Minor Components

Dissimilar components:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Dunham soils on toeslopes

Rodman Series

Drainage class: Excessively drained
Permeability: Moderately rapid in the upper part; very rapid in the lower part
Landform: Outwash plains, end moraines, and kames
Parent material: Sandy and gravelly glaciofluvial deposits

Slope range: 12 to 30 percent
Taxonomic classification: Sandy-skeletal, mixed, mesic Typic Hapludolls

Typical Pedon

Rodman gravelly loam, in an area of Casco-Rodman complex, 20 to 30 percent slopes; at an elevation of 750 feet; 500 feet south and 2,600 feet east of the northwest corner of sec. 7, T. 44 N., R. 9 E., in McHenry County, Illinois; USGS Wauconda topographic quadrangle; lat. 42 degrees 18 minutes 45 seconds N. and long. 88 degrees 13 minutes 43 seconds W., NAD 27:

A—0 to 11 inches; very dark gray (10YR 3/1) gravelly loam, dark grayish brown (10YR 4/2) dry; strong fine and medium granular structure; friable; many very fine and fine roots; 17 percent gravel; neutral; clear wavy boundary.

Bw—11 to 14 inches; 50 percent dark brown (10YR 3/3) and 50 percent brown (10YR 4/3) gravelly loam; weak fine granular structure; friable; common very fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 25 percent gravel; strongly effervescent; slightly alkaline; abrupt wavy boundary.

C—14 to 60 inches; dark yellowish brown (10YR 4/4) very gravelly sand and very gravelly loamy sand; single grain; loose; common very fine roots; 50 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 6 to 15 inches
Depth to carbonates: 10 to 20 inches
Thickness of the solum: 10 to 20 inches

A horizon:
Hue—7.5YR or 10YR
Value—2 or 3
Chroma—1 or 2
Texture—gravelly loam
Content of gravel—15 to 25 percent

Bw horizon:
Hue—7.5YR or 10YR
Value—3 or 4
Chroma—2 or 3
Texture—loam, sandy loam, gravelly loam, or gravelly sandy loam
Content of gravel—13 to 35 percent

C horizon:
Hue—10YR
Value—3 to 5
Chroma—1 to 4
Texture—the very gravelly or extremely gravelly analogs of loamy sand, sand, loamy coarse sand, or coarse sand
Content of gravel—35 to 70 percent

969E2—Casco-Rodman complex, 12 to 20 percent slopes, eroded

Setting

Landform: Kames, outwash plains, and end moraines
Position on the landform: Backslopes

Map Unit Composition

Casco and similar soils: 50 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have carbonates at or near the surface
- Soils that have slopes of less than 12 percent or more than 20 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The well drained Rush soils on shoulders and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 4.3 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Rodman Soil

Parent material: Sandy and gravelly glaciofluvial deposits
Drainage class: Excessively drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 2.6 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Low
Hazard of corrosion: Low for steel and low for concrete
Surface runoff class: Low

Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Casco—6e; Rodman—6s
Prime farmland status: Not prime farmland
Hydric soil status: Casco—not hydric; Rodman—not hydric

969F—Casco-Rodman complex, 20 to 30 percent slopes

Setting

Landform: Kames, outwash plains, and end moraines
Position on the landform: Backslopes

Map Unit Composition

Casco and similar soils: 50 percent
Rodman and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have sandy and gravelly glaciofluvial deposits beginning at a depth of more than 20 inches
- Soils that have carbonates at or near the surface
- Soils that have slopes of less than 20 percent or more than 30 percent
- Soils that have lacustrine deposits or till in the lower part of the profile

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The well drained Rush soils on shoulders and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Casco Soil

Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 3.8 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Properties and Qualities of the Rodman Soil

Parent material: Sandy and gravelly glaciofluvial deposits

Drainage class: Excessively drained
Slowest permeability within a depth of 40 inches: Moderately rapid
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 2.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Potential for frost action: Low
Hazard of corrosion: Low for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Casco—7e; Rodman—7s
Prime farmland status: Not prime farmland
Hydric soil status: Casco—not hydric; Rodman—not hydric

Rush Series

Drainage class: Well drained
Permeability: Moderate in the upper part; very rapid in the lower part
Landform: Outwash plains and stream terraces
Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Slope range: 0 to 6 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Rush silt loam, 0 to 2 percent slopes; at an elevation of 712 feet; 175 feet south and 470 feet west of the northeast corner of sec. 15, T. 39 N., R. 8 E., in Kane County, Illinois; USGS Aurora North topographic quadrangle; lat. 41 degrees 52 minutes 09 seconds N. and long. 88 degrees 18 minutes 08 seconds W., NAD 27:

A—0 to 4 inches; very dark gray (10YR 3/1) silt loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine roots; slightly acid; abrupt smooth boundary.
E—4 to 11 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak thick platy structure; friable; common very fine roots; strongly acid; abrupt smooth boundary.
Bt1—11 to 18 inches; 55 percent brown (10YR 4/3) and 45 percent dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; friable; common very fine roots; few distinct dark brown (10YR 3/3) clay films on faces of peds; strongly acid; clear smooth boundary.
Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; firm; common very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.
Bt3—24 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.
Bt4—32 to 38 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate coarse subangular blocky structure; firm; few very fine roots; few distinct brown

(10YR 4/3) and dark brown (10YR 3/3) clay films on faces of peds; slightly acid; abrupt smooth boundary.

2Bt5—38 to 45 inches; dark yellowish brown (10YR 4/4) clay loam; weak coarse subangular blocky structure; firm; few very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; 12 percent gravel; slightly acid; abrupt smooth boundary.

3C—45 to 60 inches; yellowish brown (10YR 5/4) gravelly sand; single grain; loose; 25 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 24 to 40 inches
Depth to sandy and gravelly deposits: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the solum: 40 to 70 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—clay loam, loam, sandy clay loam, or sandy loam or the gravelly analogs of these textures
Content of gravel—less than 35 percent

3C horizon:
Hue—10YR
Value—5 or 6
Chroma—2 to 4
Texture—the gravelly, very gravelly, or extremely gravelly analogs of sand, loamy sand, coarse sand, or loamy coarse sand
Content of gravel—15 to 70 percent

791A—Rush silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Rush and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Rush soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 40 inches or more than 60 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have less silt and more sand in the upper and middle parts of the subsoil than the Rush soil

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Rush Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.2 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

791B—Rush silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Rush and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Rush soil
- Soils that have sandy and gravelly outwash beginning at a depth of less than 40 inches or more than 60 inches
- Soils that have a seasonal high water table at a depth of less than 6 feet
- Soils that have less silt and more sand in the upper and middle parts of the subsoil than the Rush soil
- Soils that have slopes of less than 2 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The somewhat excessively drained Casco soils on summits and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Rush Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

791C2—Rush silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and shoulders

Map Unit Composition

Rush and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker surface layer than that of the Rush soil

- Soils that have sandy and gravelly outwash beginning at a depth of less than 40 inches or more than 60 inches
- Soils that have less silt and more sand in the upper and middle parts of the subsoil than the Rush soil
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The somewhat poorly drained Grundelein and Millstream soils on summits and footslopes
- The somewhat excessively drained Casco soils on shoulders and backslopes
- The poorly drained Dunham soils on toeslopes

Properties and Qualities of the Rush Soil

Parent material: Loess or other silty material and the underlying loamy and gravelly outwash
Drainage class: Well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Very rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.5 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: Moderate for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

Sawmill Series

Drainage class: Poorly drained
Permeability: Moderate
Landform: Flood plains
Parent material: Alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls

Typical Pedon

Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded; at an elevation of 636 feet; 1,350 feet south and 140 feet west of the northeast corner of sec. 31, T. 30 N., R. 3 E., in Livingston County, Illinois; USGS Long Point topographic quadrangle; lat. 41 degrees 01 minute 37 seconds N. and long. 88 degrees 54 minutes 42 seconds W., NAD 27:

Ap—0 to 9 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

A1—9 to 17 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; clear smooth boundary.
A2—17 to 24 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate medium granular; friable; few very fine roots; 1 percent gravel; neutral; clear smooth boundary.
A3—24 to 29 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium prismatic structure parting to moderate fine angular blocky; friable; few very fine roots; 1 percent gravel; neutral; clear smooth boundary.
Bg1—29 to 36 inches; dark gray (5Y 4/1) silty clay loam; weak medium prismatic structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.
Bg2—36 to 41 inches; dark gray (5Y 4/1) silty clay loam; weak medium prismatic structure; friable; few very fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; clear smooth boundary.
BCg—41 to 48 inches; dark gray (5Y 4/1) silty clay loam; very weak medium prismatic structure; firm; few very fine roots; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine distinct dark grayish brown (10YR 4/2) iron depletions in the matrix; 1 percent gravel; neutral; abrupt smooth boundary.
Cg—48 to 60 inches; 60 percent gray (10YR 5/1) and 40 percent brownish yellow (10YR 6/6) silt loam; massive; firm; few fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; 1 percent gravel; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 24 to 36 inches
Depth to carbonates: More than 48 inches
Thickness of the solum: 36 to 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—silty clay loam

Bg or BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 6
Chroma—1 or 2
Texture—silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or clay loam with strata of loam, silt loam, or sandy loam
Content of gravel—less than 10 percent

1107A—Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Sawmill and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more sand or silt in the upper two-thirds of the profile than the Sawmill soil
- Soils that are subject to occasional flooding
- Soils that have a thinner surface soil than that of the Sawmill soil

Dissimilar soils:
- The very poorly drained Houghton soils on toeslopes of adjacent landforms
- The poorly drained, calcareous Millington soils on flood plains

Properties and Qualities of the Sawmill Soil

Parent material: Alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 11.6 inches
Content of organic matter in the surface layer: 4 to 7 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, November through June
Ponding depth: 0 to 0.5 foot, November through June
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

3107A—Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Sawmill and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less clay and more sand or silt in the upper two-thirds of the profile than the Sawmill soil
- Soils that are subject to occasional flooding
- Soils that have a thinner surface soil than that of the Sawmill soil

Dissimilar soils:
- The poorly drained, calcareous Millington soils on flood plains

Properties and Qualities of the Sawmill Soil

Parent material: Alluvium
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 11.6 inches
Content of organic matter in the surface layer: 4 to 7 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 1 foot, January through May
Ponding depth: 0 to 0.5 foot, January through May
Frequency and most likely period of flooding: Frequent, November through June
Potential for frost action: High
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3w
Prime farmland status: Prime farmland where drained and either protected from flooding or not frequently flooded during the growing season
Hydric soil status: Hydric

Saylesville Series

Drainage class: Moderately well drained
Permeability: Moderately slow
Landform: Lake plains
Parent material: Lacustrine deposits
Slope range: 2 to 6 percent
Taxonomic classification: Fine, illitic, mesic Oxyaquic Hapludalfs
Taxadjunct features: The Saylesville soils in this survey area have redoximorphic features within a depth of 40 inches.

Typical Pedon

Saylesville silt loam, 2 to 4 percent slopes; at an elevation of 747 feet; 765 feet north and 1,065 feet west of the southeast corner of sec. 10, T. 46 N., R. 9 E., in Lake County, Illinois; USGS Fox Lake topographic quadrangle; lat. 42 degrees 28 minutes 33 seconds N. and long. 88 degrees 09 minutes 49 seconds W., NAD 27:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

Bt1—9 to 15 inches; brown (10YR 4/3) silty clay loam; moderate fine subangular blocky structure; friable; common very fine roots; few distinct dark brown (10YR 3/3) clay films on faces of peds; very few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear wavy boundary.

Bt2—15 to 21 inches; brown (10YR 4/3) silty clay; moderate fine and medium prismatic structure parting to moderate fine subangular blocky; firm; common very fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; very few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; neutral; gradual wavy boundary.

Bt3—21 to 28 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; slightly effervescent; slightly alkaline; clear wavy boundary.

BCt—28 to 34 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; common very fine roots; very few prominent very pale brown (10YR 8/2) carbonate coatings on faces of peds; very few distinct dark grayish brown (10YR 4/2) clay films and very dark grayish brown (10YR 3/2) organo-clay films on faces of peds and in pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; strongly effervescent; moderately alkaline; gradual wavy boundary.

C1—34 to 39 inches; yellowish brown (10YR 5/4) silty clay loam; massive; firm; common very fine roots; few prominent very pale brown (10YR 8/2) carbonate coatings along cleavage planes; very few distinct very dark grayish brown (10YR 3/2) coatings in root channels and/or pores; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and light brownish gray (10YR 6/2) iron depletions in the matrix; violently effervescent; moderately alkaline; gradual wavy boundary.

C2—39 to 60 inches; light yellowish brown (10YR 6/4) silty clay loam; massive; firm; common prominent very pale brown (10YR 8/2) and light gray (10YR 7/1) carbonate coatings along cleavage planes; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation and light brownish gray (10YR 6/2) iron depletions in the matrix; violently effervescent; moderately alkaline.

Range in Characteristics

Depth to carbonates: 18 to 40 inches
Thickness of the solum: 20 to 40 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silty clay

C horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silt loam

370B—Saylesville silt loam, 2 to 4 percent slopes

Setting

Landform: Lake plains
Position on the landform: Backslopes and summits

Map Unit Composition

Saylesville and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have till in the lower part of the profile
- Soils that have a darker surface layer than that of the Saylesville soil
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Saylesville Soil

Parent material: Lacustrine deposits
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 8.5 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

370C2—Saylesville silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Lake plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Saylesville and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that are severely eroded
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have till in the lower part of the profile
- Soils that have a darker surface layer than that of the Saylesville soil
- Soils that have slopes of less than 4 percent or more than 6 percent

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Del Rey soils on summits and footslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Saylesville Soil

Parent material: Lacustrine deposits
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderately slow
Permeability below a depth of 60 inches: Moderately slow
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 8.7 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Very high
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

Selmass Series

Drainage class: Poorly drained
Permeability: Moderate in the upper part; rapid in the lower part

Landform: Outwash plains and stream terraces
Parent material: Outwash
Slope range: 0 to 2 percent
Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Selmass loam, undrained, 0 to 2 percent slopes; at an elevation of 835 feet; 675 feet north and 1,500 feet east of the southwest corner of sec. 23, T. 44 N., R. 6 E., in McHenry County, Illinois; USGS Marengo North topographic quadrangle; lat. 42 degrees 16 minutes 16 seconds N. and long. 88 degrees 30 minutes 18 seconds W., NAD 27:

Ap—0 to 6 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; strong fine granular structure; friable; many very fine roots; neutral; clear smooth boundary.

A1—6 to 10 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; many very fine roots; neutral; clear smooth boundary.

A2—10 to 23 inches; very dark gray (10YR 3/1) loam, gray (10YR 5/1) dry; weak fine and medium subangular blocky structure parting to weak medium granular; friable; common very fine roots; few distinct very dark gray (2.5Y 3/1) organic coatings on faces of peds and in pores; neutral; clear smooth boundary.

BAg—23 to 27 inches; dark grayish brown (2.5Y 4/2) loam; moderate very fine and fine subangular blocky structure; friable; common very fine roots; few distinct very dark gray (2.5Y 3/1) organic coatings on faces of peds and in pores; common fine and medium faint light olive brown (2.5Y 5/3) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bg1—27 to 36 inches; 65 percent grayish brown (2.5Y 5/2), 30 percent dark grayish brown (2.5Y 4/2), and 5 percent yellowish brown (10YR 5/6) loam; moderate fine and medium subangular blocky structure; friable; common very fine roots; few distinct very dark gray (2.5Y 3/1) organic coatings on faces of peds and in pores; neutral; gradual smooth boundary.

Bg2—36 to 50 inches; light brownish gray (2.5Y 6/2), stratified sandy loam and loam; weak medium prismatic structure parting to weak medium subangular blocky; friable; common very fine roots; very dark gray (2.5Y 3/1) krotovina; common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many medium and coarse faint grayish brown (2.5Y 5/2) iron depletions in the matrix; 1 percent gravel; slightly alkaline; gradual wavy boundary.

Cg—50 to 60 inches; stratified 50 percent light brownish gray (2.5Y 6/2) sand and 50 percent grayish brown (2.5Y 5/2) loamy sand; single grain; loose; 1 percent gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 24 inches
Depth to sandy outwash: 35 to 55 inches
Depth to carbonates: More than 35 inches
Thickness of the solum: 35 to 55 inches

Ap or A horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 3
Chroma—0 to 2
Texture—loam

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 to 6

Chroma—0 to 2
Texture—loam or clay loam; sandy loam or loamy sand included in the lower part

2Cg or 2C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 to 4
Texture—sand or loamy sand
Content of gravel—less than 15 percent

1529A—Selmass loam, undrained, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Toeslopes

Map Unit Composition

Selmass and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have less sand and more silt in the upper two-thirds of the profile than the Selmass soil
- Soils that have less sand and more clay or silt in the lower part of the profile than the Selmass soil
- Soils that have a thinner subsurface layer than that of the Selmass soil

Dissimilar soils:
- The very poorly drained Houghton soils on toeslopes

Properties and Qualities of the Selmass Soil

Parent material: Outwash
Drainage class: Poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.8 inches
Content of organic matter in the surface layer: 4 to 6 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0 to 0.5 foot, November through June
Ponding depth: 0 to 0.5 foot, November through June
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 5w
Prime farmland status: Not prime farmland
Hydric soil status: Hydric

839B—Udipsamments complex, undulating

Setting

Landform: Beach ridges and beach terraces (fig. 8)
Position on the landform: Typic Udipsamments—summits and backslopes; Aquic Udipsamments—footslopes

Map Unit Composition

Typic Udipsamments and similar soils: 55 percent
Aquic Udipsamments and similar soils: 35 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have more gravel in the lower one-half of the profile than the Udipsamments
- Soils that have slopes of more than 6 percent

Dissimilar soils:
- The very poorly drained Adrian soils on toeslopes
- The poorly drained Granby soils on toeslopes

Properties and Qualities of the Typic Udipsamments

Parent material: Wind-worked beach sand
Drainage class: Somewhat excessively drained
Slowest permeability within a depth of 40 inches: Rapid
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 3.1 inches
Content of organic matter in the surface layer: 0.5 to 1.5 percent
Shrink-swell potential: Low
Ponding: None
Flooding: None
Potential for frost action: Low
Hazard of corrosion: Low for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Very high

Properties and Qualities of the Aquic Udipsamments

Parent material: Wind-worked beach sand
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Rapid
Permeability below a depth of 60 inches: Rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 3.3 inches
Content of organic matter in the surface layer: 0.5 to 2.0 percent
Shrink-swell potential: Low
Depth and months of the highest apparent seasonal high water table: 1 to 2 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: Low
Hazard of corrosion: Low for steel and moderate for concrete

Figure 8.—Native vegetation in an area of Udipsamments complex, undulating, in Illinois Beach State Park.

Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Very high

Interpretive Groups

Land capability classification: Typic Udipsamments—6s; Aquic Udipsamments—4s
Prime farmland status: Not prime farmland
Hydric soil status: Typic Udipsamments—not hydric; Aquic Udipsamments—not hydric

Varna Series

Drainage class: Moderately well drained
Permeability: Slow
Landform: Ground moraines, end moraines, and lake plains
Parent material: Thin mantle of loess or other silty material and the underlying till
Slope range: 2 to 6 percent
Taxonomic classification: Fine, illitic, mesic Oxyaquic Argiudolls
Taxadjunct features: The Varna soil in map unit 223C2 has a mollic epipedon less than 10 inches thick. This soil is classified as a fine, illitic, mesic Mollic Oxyaquic Hapludalf.

Typical Pedon

Varna silt loam, 2 to 4 percent slopes; at an elevation of 722 feet; 35 feet north and 860 feet east of the southwest corner of sec. 6, T. 29 N., R. 11 E., in Kankakee County, Illinois; USGS Hersher topographic quadrangle; lat. 41 degrees 00 minutes 54 seconds N. and long. 88 degrees 00 minutes 50 seconds W., NAD 27:

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.

A—8 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; slightly acid; clear smooth boundary.

2Bt1—12 to 18 inches; brown (10YR 4/3) silty clay loam; moderate very fine subangular blocky structure; firm; many distinct very dark gray (10YR 3/1) organo-clay films on faces of peds; 5 percent fine gravel; moderately acid; clear smooth boundary.

2Bt2—18 to 24 inches; dark yellowish brown (10YR 4/4) silty clay; weak fine prismatic structure parting to moderate very fine and fine subangular blocky; firm; many distinct very dark grayish brown (10YR 3/2) organo-clay films on faces of peds; 5 percent fine gravel; moderately acid; clear smooth boundary.

2Bt3—24 to 30 inches; light olive brown (2.5Y 5/4) silty clay; weak fine prismatic structure parting to moderate fine angular and subangular blocky; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent fine gravel; neutral; clear wavy boundary.

2Bt4—30 to 42 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to moderate fine and medium angular and subangular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; 5 percent fine gravel; slightly effervescent; slightly alkaline; gradual smooth boundary.

2BCt—42 to 48 inches; 50 percent yellowish brown (10YR 5/6) and 50 percent gray (5Y 5/1) silty clay loam; weak medium prismatic structure parting to weak medium subangular and angular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; 2 percent fine gravel; slightly effervescent; moderately alkaline; gradual wavy boundary.

2Cd—48 to 60 inches; 90 percent yellowish brown (10YR 5/4 and 5/6) and 10 percent gray (5Y 5/1) silty clay loam; massive; very firm; 5 percent fine gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 16 inches
Thickness of the loess or other silty material: Less than 18 inches
Depth to carbonates: 24 to 42 inches
Thickness of the solum: 24 to 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam, silty clay, or clay

2Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or clay loam

223B—Varna silt loam, 2 to 4 percent slopes

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and summits

Map Unit Composition

Varna and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have less clay and more sand or silt in the subsoil than the Varna soil
- Soils that are moderately eroded
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 8.7 inches
Content of organic matter in the surface layer: 2.5 to 4.0 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

223C2—Varna silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Ground moraines and end moraines
Position on the landform: Backslopes and shoulders

Map Unit Composition

Varna and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have less clay and more sand or silt in the subsoil than the Varna soil
- Soils that are only slightly eroded
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Elliott soils on summits and footslopes
- The poorly drained Ashkum soils on toeslopes

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 8.6 inches
Content of organic matter in the surface layer: 2 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

984B—Barrington and Varna silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and backslopes

Map Unit Composition

Barrington and similar soils: 45 percent
Varna and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thinner surface layer than that of the Barrington and Varna soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Barrington Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.9 inches
Content of organic matter in the surface layer: 3 to 5 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: Moderate for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Varna Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 8.7 inches
Content of organic matter in the surface layer: 2.5 to 4.0 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Barrington—2e; Varna—2e
Prime farmland status: Prime farmland
Hydric soil status: Barrington—not hydric; Varna—not hydric

Wauconda Series

Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 4 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs

Typical Pedon

Wauconda silt loam, 0 to 2 percent slopes; at an elevation of 778 feet; 1,780 feet north and 2,640 feet west of the southeast corner of sec. 13, T. 45 N., R. 10 E., in Lake County, Illinois; USGS Antioch topographic quadrangle; lat. 42 degrees 22 minutes 34 seconds N. and long. 88 degrees 00 minutes 55 seconds W., NAD 27:

Ap—0 to 9 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure parting to weak medium granular; friable; common very fine roots; neutral; clear smooth boundary.

E—9 to 14 inches; dark gray (2.5Y 4/1) silt loam; weak fine and medium subangular blocky structure parting to moderate fine and medium granular; friable; common very fine roots; few distinct black (10YR 2/1) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—14 to 23 inches; brown (10YR 4/3) silty clay loam; weak medium prismatic structure parting to moderate fine and medium subangular blocky; friable; common very fine roots; common distinct very dark gray (10YR 3/1) organo-clay films and dark grayish brown (2.5Y 4/2) clay films on faces of peds; common fine and medium faint olive brown (2.5Y 4/4) and few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt2—23 to 30 inches; light olive brown (2.5Y 5/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct olive brown (2.5Y 4/3) clay films on faces of peds; common fine black (2.5Y 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common fine and medium distinct light brownish gray (2.5Y 6/2) iron depletions in the matrix; slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—30 to 38 inches; light olive brown (2.5Y 5/3), stratified sandy loam and silt loam; weak medium subangular blocky structure; very friable; common fine black (2.5Y 2.5/1) very weakly cemented iron and manganese oxide concretions throughout; common fine faint light brownish gray (2.5Y 6/2) iron depletions in the matrix; 10 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

2C1—38 to 41 inches; light olive brown (2.5Y 5/4) loamy coarse sand; single grain; loose; 13 percent gravel; strongly effervescent; moderately alkaline; abrupt smooth boundary.

2C2—41 to 60 inches; brown (10YR 5/3), stratified silt loam and sandy loam; massive; firm; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; 2 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

E horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam, loam, sandy loam, or fine sandy loam
Content of gravel—less than 10 percent

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—stratified silt loam to loamy sand
Content of gravel—less than 15 percent

697A—Wauconda silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and footslopes

Map Unit Composition

Wauconda and similar soils: 90 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Wauconda soil
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Not hydric

697B—Wauconda silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and footslopes

Map Unit Composition

Wauconda and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Wauconda soil
- Soils that have slopes of less than 2 percent
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda soil

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid

Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.7 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

978A—Wauconda and Beecher silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Footslopes and summits

Map Unit Composition

Wauconda and similar soils: 45 percent
Beecher and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Wauconda and Beecher soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Beecher soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate

Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.8 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Low
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2w; Beecher—2w
Prime farmland status: Prime farmland where drained
Hydric soil status: Wauconda—not hydric; Beecher—not hydric

978B—Wauconda and Beecher silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Wauconda and similar soils: 45 percent
Beecher and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Wauconda and Beecher soils
- Soils that have lacustrine deposits in the lower part of the profile

- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Beecher soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.7 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Beecher Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 24 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.4 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and high for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2e; Beecher—2e
Prime farmland status: Prime farmland
Hydric soil status: Wauconda—not hydric; Beecher—not hydric

981A—Wauconda and Frankfort silt loams, 0 to 2 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Summits and footslopes

Map Unit Composition

Wauconda and similar soils: 50 percent
Frankfort and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a darker subsurface layer than that of the Wauconda and Frankfort soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of more than 2 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Frankfort soils

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Negligible
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 5.9 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate

Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2w; Frankfort—3w
Prime farmland status: Prime farmland where drained
Hydric soil status: Wauconda—not hydric; Frankfort—not hydric

981B—Wauconda and Frankfort silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and footslopes

Map Unit Composition

Wauconda and similar soils: 50 percent
Frankfort and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker dark surface layer than that of the Wauconda and Frankfort soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have a seasonal high water table beginning at a depth of more than 2 feet
- Soils that have a lighter colored surface layer than that of the Wauconda and Frankfort soils
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Wauconda Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 9.7 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 0.5 foot to 2.0 feet, January through May

Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Frankfort Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 42 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 2 to 4 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Wauconda—2e; Frankfort—3e
Prime farmland status: Prime farmland
Hydric soil status: Wauconda—not hydric; Frankfort—not hydric

Zurich Series

Drainage class: Moderately well drained
Permeability: Moderate
Landform: Outwash plains, stream terraces, and lake plains
Parent material: Loess or other silty material and the underlying outwash
Slope range: 0 to 12 percent
Taxonomic classification: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon

Zurich silt loam, 2 to 4 percent slopes; at an elevation of 640 feet; 300 feet north and 2,260 feet east of the southwest corner of sec. 23, T. 43 N., R. 11 E., in Lake County, Illinois; USGS Wheeling topographic quadrangle; lat. 42 degrees 10 minutes 59 seconds N. and long. 87 degrees 55 minutes 01 second W., NAD 27:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

E—5 to 9 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent brown (10YR 4/3) silt loam, light brownish gray (10YR 6/2) dry; weak thick platy structure parting to weak fine subangular blocky; friable; few very fine and fine roots;

common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BE—9 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine subangular blocky structure; friable; few very fine and fine roots; few distinct light brownish gray (10YR 6/2) (dry) silt coatings on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Bt1—16 to 23 inches; brown (7.5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few very fine roots; few distinct light brownish gray (10YR 6/2) (dry) silt coatings on faces of peds; many distinct brown (7.5YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—23 to 28 inches; brown (7.5YR 4/4) silt loam; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.

2Bt3—28 to 31 inches; brown (7.5YR 4/3) loam; moderate medium subangular blocky structure; friable; few very fine roots; common distinct brown (7.5YR 4/2) clay films on faces of peds; common medium faint grayish brown (10YR 5/2) and distinct light brownish gray (10YR 6/2) iron depletions in the matrix; very slightly effervescent; slightly alkaline; clear smooth boundary.

2BC—31 to 38 inches; yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; friable; few very fine roots; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; common medium distinct yellowish brown (10YR 5/6) and faint brown (7.5YR 4/4) masses of iron accumulation in the matrix; many medium coarse distinct light brownish gray (10YR 6/2) iron depletions in the matrix; slightly effervescent; moderately alkaline; gradual smooth boundary.

2C—38 to 64 inches; 70 percent yellowish brown (10YR 5/4 and 5/6) and 30 percent light brownish gray (10YR 6/2), stratified silt loam and very fine sandy loam; massive; friable; common fine black (10YR 2/1) very weakly cemented iron and manganese oxide concretions throughout; few fine and medium white (10YR 8/1) carbonate concretions throughout; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the solum: 24 to 45 inches

Ap or A horizon:
Hue—10YR
Value—3 or 4
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Bt or BE horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4
Texture—silty clay loam or silt loam

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, loam, sandy loam, or fine sandy loam
Content of gravel—less than 10 percent

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—stratified silt loam to loamy sand
Content of gravel—less than 15 percent

696A—Zurich silt loam, 0 to 2 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits

Map Unit Composition

Zurich and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Zurich soil
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low

Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 1
Prime farmland status: Prime farmland
Hydric soil status: Not hydric

696B—Zurich silt loam, 2 to 4 percent slopes

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Summits and backslopes

Map Unit Composition

Zurich and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Zurich soil
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 2e

Prime farmland status: Prime farmland
Hydric soil status: Not hydric

696C2—Zurich silt loam, 4 to 6 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes and shoulders

Map Unit Composition

Zurich and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that are severely eroded

Dissimilar soils:
- The well drained, loamy Orthents on summits and backslopes
- The somewhat poorly drained Aptakisic soils on summits and footslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.4 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e

Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

696D2—Zurich silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Outwash plains and stream terraces
Position on the landform: Backslopes

Map Unit Composition

Zurich and similar soils: 92 percent
Dissimilar soils: 8 percent

Minor Components

Similar soils:
- Soils that have carbonates beginning at a depth of more than 40 inches
- Soils that have lacustrine deposits or till in the lower part of the profile
- Soils that have outwash beginning at a depth of less than 20 inches or more than 40 inches
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 6 percent or more than 12 percent
- Soils that are severely eroded

Dissimilar soils:
- The somewhat poorly drained Aptakisic soils on summits and footslopes
- The poorly drained Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.1 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: High
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: 3e
Prime farmland status: Not prime farmland
Hydric soil status: Not hydric

840B—Zurich and Ozaukee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and summits

Map Unit Composition

Zurich and similar soils: 45 percent
Ozaukee and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are moderately eroded
- Soils that have a thicker, darker surface layer than that of the Zurich and Ozaukee soils
- Soils that have a seasonal high water table beginning at a depth of less than 2.0 feet or more than 3.5 feet
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that have lacustrine deposits in the lower part of the profile

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 8.2 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate

Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—2e; Ozaukee—2e
Prime farmland status: Prime farmland
Hydric soil status: Zurich—not hydric; Ozaukee—not hydric

840C2—Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Backslopes and shoulders

Map Unit Composition

Zurich and similar soils: 45 percent
Ozaukee and similar soils: 45 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that are only slightly eroded
- Soils that have a seasonal high water table beginning at a depth of more than 3.5 feet
- Soils that have slopes of less than 4 percent or more than 6 percent
- Soils that have lacustrine deposits in the lower part of the profile

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The somewhat poorly drained Aptakisic and Blount soils on footslopes and summits
- The poorly drained Ashkum and Pella soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.4 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.

Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Medium
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Ozaukee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Slow
Permeability below a depth of 60 inches: Slow
Depth to restrictive feature: 20 to 45 inches to dense material
Available water capacity to a depth of 60 inches: About 7.2 inches
Content of organic matter in the surface layer: 1 to 2 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Accelerated erosion: The surface layer has been thinned by erosion.
Potential for frost action: Moderate
Hazard of corrosion: High for steel and low for concrete
Surface runoff class: High
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—3e; Ozaukee—2e
Prime farmland status: Not prime farmland
Hydric soil status: Zurich—not hydric; Ozaukee—not hydric

983B—Zurich and Nappanee silt loams, 2 to 4 percent slopes

Setting

Landform: Ground moraines, lake plains, and outwash plains
Position on the landform: Zurich—summits and backslopes; Nappanee—backslopes and footslopes

Map Unit Composition

Zurich and similar soils: 50 percent
Nappanee and similar soils: 40 percent
Dissimilar soils: 10 percent

Minor Components

Similar soils:
- Soils that have a thicker, darker surface layer than that of the Zurich and Nappanee soils
- Soils that have lacustrine deposits in the lower part of the profile
- Soils that have slopes of less than 2 percent or more than 4 percent
- Soils that are moderately eroded

Dissimilar soils:
- The moderately well drained, clayey Orthents on summits and backslopes
- The poorly drained Montgomery soils on toeslopes

Properties and Qualities of the Zurich Soil

Parent material: Loess or other silty material and the underlying outwash
Drainage class: Moderately well drained
Slowest permeability within a depth of 40 inches: Moderate
Permeability below a depth of 60 inches: Moderate or moderately rapid
Depth to restrictive feature: More than 80 inches
Available water capacity to a depth of 60 inches: About 10.3 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest apparent seasonal high water table: 2.0 to 3.5 feet, February through April
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: Low
Susceptibility to water erosion: Moderate
Susceptibility to wind erosion: Low

Properties and Qualities of the Nappanee Soil

Parent material: Thin mantle of loess or other silty material and the underlying till
Drainage class: Somewhat poorly drained
Slowest permeability within a depth of 40 inches: Very slow
Permeability below a depth of 60 inches: Very slow
Depth to restrictive feature: 24 to 60 inches to dense material
Available water capacity to a depth of 60 inches: About 6 inches
Content of organic matter in the surface layer: 1 to 3 percent
Shrink-swell potential: Moderate
Depth and months of the highest perched seasonal high water table: 0.5 foot to 2.0 feet, January through May
Ponding: None
Flooding: None
Potential for frost action: High
Hazard of corrosion: High for steel and moderate for concrete
Surface runoff class: High
Susceptibility to water erosion: Low
Susceptibility to wind erosion: Low

Interpretive Groups

Land capability classification: Zurich—2e; Nappanee—3e
Prime farmland status: Prime farmland
Hydric soil status: Zurich—not hydric; Nappanee—not hydric

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Soil Series and Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1997, Lake County had about 41,519 acres of cropland (U.S Department of Commerce, 1997). The major row crops are corn and soybeans. Wheat is the major small grain crop, and alfalfa is the major forage crop.

The soils in Lake County have good potential for continued crop production, especially if the latest crop production technology is applied. This soil survey can be used as a guide for applying the latest crop production technologies.

The major management concerns affecting the use of the soils in the county as cropland are water erosion, poor tilth, crusting, wetness, ponding, restricted permeability, excessive permeability, and root-restrictive layers.

Soil erosion is a potential problem on soils that have slopes of more than 2 percent, such as Beecher and Grays soils. It is also a hazard in areas where the slopes are long and less than 2 percent and runoff water is concentrated.

Loss of the surface layer through sheet and rill erosion is damaging for several reasons. Soil productivity is reduced as the surface soil is removed and part of the subsoil is incorporated into the plow layer. The subsoil is generally lower in plant nutrients, lower in organic matter, and higher in clay content than the surface soil. As the content of organic matter decreases in the plow layer and the clay content increases, soil tilth deteriorates. As a result, surface crusting can occur and the rate of water infiltration is reduced. Under these conditions, preparing a good seedbed could be difficult. Soil erosion results in the sedimentation of streams, rivers, road ditches, and lakes. This sedimentation reduces the quality of water for agricultural, municipal, and recreational uses and for fish and wildlife. Removing the sediment generally is expensive. Erosion control helps to minimize this pollution and improves water quality.

Erosion-control measures include both cultural and structural practices. The most widely used practice in the county is a system of conservation tillage, such as chisel plowing, no-till farming (fig. 9), or ridge planting. These systems can leave 20 to 90 percent of the surface covered with crop residue. No-till farming is most effective in areas of moderately well drained and well drained soils, such as Barrington and Dresden soils. Another cultural practice is a crop rotation that includes 1 or more years of close-growing grasses or legumes. If slopes are smooth and uniform, terraces and contour farming are also effective in controlling erosion.

Structural practices are needed in drainageways where concentrated runoff flows overland. Establishing grassed waterways or erosion-control structures can reduce the hazard of erosion in these areas.

Further information about erosion-control measures suitable for each kind of soil is provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Figure 9.—No-till beans planted in corn stubble in an area of Ozaukee silt loam, 4 to 6 percent slopes, eroded. No-till farming can help to control erosion.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the rate of water infiltration. Soils that have good tilth are granular and porous and have a high content of organic matter.

Poor tilth is a problem on soils that have a surface layer of silty clay loam or silty clay. Ashkum and Pella soils are examples. If these soils are plowed when wet, the surface layer can become cloddy. This cloddiness hinders the preparation of a good seedbed. Tilling in the fall and leaving the soil surface rough with moderate amounts of crop residue generally result in good tilth in the spring. A system of strip or ridge tillage may also work well in areas of these soils.

Surface crusting can also be a problem in areas of Del Rey and Ozaukee soils, which have a surface layer of silt loam or loam and a low content of organic matter. Generally, the structure of these soils is weak, and a crust forms on the surface during periods of intense rainfall. This crust is hard when dry. It inhibits seedling emergence, reduces the infiltration rate, and increases runoff and erosion. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting.

Drainage systems have been installed in most areas of poorly drained and somewhat poorly drained soils used as cropland in the county; therefore, these soils are adequately drained for the commonly grown crops. Measures that maintain the drainage system are needed. Poorly drained soils, such as Dunham and Pella soils, have subsurface drainage. Also, in some areas of poorly drained and very poorly drained soils, such as Montgomery and Peotone soils, surface tile inlets or shallow surface ditches are needed to remove excess water. In some areas, somewhat poorly drained soils are wet long enough that in some years productivity is reduced, unless they are artificially drained. Somewhat poorly drained soils, such as Elliott and Mundelein soils, have subsurface drainage.

Restricted permeability in the soil can increase the susceptibility to erosion. As water movement slows within a soil, the chance for runoff increases. The very slowly permeable Nappanee soils are more susceptible to erosion than the moderately slowly permeable Saylesville soils. The hazard of erosion resulting from restricted permeability can be reduced by applying a cropping system that leaves crop residue on the surface after planting, incorporating green manure crops or crop residue into the soil, and using conservation cropping systems.

Restricted permeability can also limit the effectiveness of drainage systems. For example, the tile spacing in areas of the slowly permeable Elliott soils should be narrower than that in areas of the moderately permeable Mundelein soils for the drainage system to be as effective in lowering the seasonal high water table.

In areas where the soils have excessive permeability, such as areas of Fox and Rush soils, the potential for ground-water contamination is a concern. These soils contain sandy and gravelly deposits within a depth of 60 inches and are very rapidly permeable in the lower part of the profile.

Several measures can be used to limit the amount of deep leaching of nutrients and pesticides that occurs. Applications of fertilizer should be based on the results of soil tests. The local office of the Cooperative Extension Service can help in determining the kinds and proper amounts of nutrients needed. Chemicals should be selected based on their solubility in water, their ability to bind with the soil, and the rate of their breakdown in the soil. Splitting chemical applications, particularly applications of nitrogen, is beneficial. This practice reduces the chance for excessive leaching from a one-time application. Also, planting legumes in a crop rotation or as a cover crop adds nitrogen to the soil, thereby reducing the amount of nitrogen needed in chemical applications. The practice of crop rotation is also effective in limiting the buildup of weed and insect populations and therefore reduces the amount of herbicides and insecticides needed per application. Finally, the use of small grain cover crops following fertilized corn crops can be effective in taking up some residual nitrogen from the soil.

A root-restrictive layer limits the available water capacity in the soil. Some soils, such as Blount, Frankfort, and Ozaukee soils, are moderately deep to layers that restrict the penetration of plant roots. Increasing the rate of water infiltration, reducing the runoff rate, or planting drought-tolerant species can minimize the effects of this limitation. Planting cover crops and using a system of conservation tillage that leaves crop residue on the surface after planting increase the rate of water infiltration and reduce the runoff rate. Planting drought-tolerant species, such as soybeans and winter wheat, is beneficial because these crops make the most efficient use of the limited amount of water.

Proper management is needed on hayland to prolong the life of desirable forage species, maintain or improve the quality and quantity of forage, and control erosion and reduce runoff. Hay may last as a vigorous crop for 4 to 5 years, depending on management and on the varieties seeded. Suitable hay plants include several legumes and cool-season grasses. Alfalfa is the legume most commonly grown for hay. It is often used in mixtures with smooth bromegrass and orchardgrass. Alfalfa is best suited to moderately well drained soils, such as Barrington and Markham soils. Red clover also is grown for hay. Measures that maintain or improve fertility are needed. The amount of lime and fertilizer to be added should be based on the results of soil tests, the needs of the plants, and the expected level of yields. Seed varieties should be selected in accordance with the soil properties and the drainage conditions of the specific tract of land.

Overgrazing reduces the vigor of pasture plants and reduces forage production. It also results in an increase in the extent of weeds and brush. Deferred grazing, rotation grazing, and proper stocking rates help to prevent overgrazing. Deferred grazing allows the plants in pastures that are not being used to build up reserves of carbohydrates. Rotating grazing among several pastures allows each area a rest period.

Many of the soils in the survey area have a high water table in the spring. Deferred grazing during wet periods can minimize surface compaction. Pasture renovation also helps to prevent compaction. Frost heave can damage alfalfa and red clover in areas that have a seasonal high water table. Leaving a cover of stubble 4 to 6 inches high during the winter and using mixtures of grasses and legumes help to prevent frost heave.

Limitations Affecting Crops and Pasture

The management concerns affecting the use of the detailed soil map units in the survey area for crops and pasture are shown in table 6. The main concerns in managing cropland are controlling water erosion, soil wetness, and ponding; minimizing surface crusting; improving poor tilth; and limiting the effects of excessive permeability, restricted permeability, and root-restrictive layers. The major management concerns affecting pastureland are frost heave, water erosion, wetness, ponding, low pH, root-restrictive layers, limited available water capacity, low fertility, excess lime, equipment limitations, wind erosion, flooding, and rock fragments on or near the surface.

Cropland

Generally, a combination of several practices is needed to control water erosion. Conservation tillage, stripcropping, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to minimize excessive soil loss (fig. 10).

In some areas used as cropland, wetness and ponding are management concerns. Drainage systems consist of subsurface tile drains, surface inlet tile, open drainage

Figure 10.—A combination of stripcropping and grassed waterways helps to control erosion in an area of Markham soils.

ditches, or a combination of these. Measures that maintain the drainage system are needed.

Practices that minimize surface crusting and improve soil tilth include incorporating green manure crops, manure, or crop residue into the soil and using a system of conservation tillage. Surface cloddiness can be controlled by avoiding tillage when the soil is too wet.

Excessive permeability can cause deep leaching of nutrients and pesticides. Selecting appropriate chemicals and using split application methods reduce the hazard of ground-water contamination.

Restricted permeability can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Conserving moisture is important in areas where the soils have a limited available water capacity. It primarily involves reducing the evaporation and runoff rates and increasing the rate of water infiltration. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

A root-restrictive layer in the soil limits the total amount of moisture available to plants. Planting cover crops and using a system of conservation tillage that leaves crop residue on the surface after planting increase the rate of water infiltration and reduce the runoff rate. Also, planting drought-tolerant crop species helps to make the most efficient use of the limited supply of moisture in the soil.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are flooding, depth to bedrock, and subsidence.

Additional limitations and hazards are as follows:

Excess lime.—This limitation can be overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

Flooding.—Winter small grain crops can be damaged. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Low pH or *high pH*.—Reaction can affect plant growth by influencing the uptake or absorption of certain nutrients by plants.

Subsidence.—Subsidence occurs as a result of shrinkage from drying, consolidation because of the loss of ground water, compaction from tillage, wind erosion, burning, and biochemical oxidation. Limiting the amount of drainage, avoiding excessive tillage and tillage when the soil is wet, and using a system of conservation tillage that leaves crop residue on the surface after planting help to control subsidence.

Wind erosion.—Using a system of conservation tillage that leaves crop residue on the surface after planting and keeping the surface rough help to control this hazard.

The criteria used to determine some of the limitations or hazards in the table are described in the following paragraphs.

Crusting.—The average content of organic matter in the surface layer is less than 2.5 percent, and the clay content is greater than 20 percent.

Excess lime.—The calcium carbonate equivalent is 15 percent or more, and the calcic horizon classification criteria are met.

Excessive permeability.—The upper limit of the permeability range is 6 inches or more within the soil profile.

Flooding.—The soil is occasionally flooded or frequently flooded.

Limited available water capacity.—The weighted average of the available water capacity between the surface and a depth of 40 inches is 0.10 inch or less.

Ponding.—A water table is above the surface.

Poor tilth.—The soil has 27 percent or more clay in the surface layer.

Restricted permeability.—Permeability is less than 0.2 inch per hour between the surface and a depth of 40 inches.

Root-restrictive layer.—Dense material is within a depth of 40 inches.

Subsidence.—The decrease in surface elevation is more than 0 inches.

Water erosion.—The K factor of the surface layer multiplied by the slope is greater than 0.8, and the slope is 3 percent or more.

Wetness.—The seasonal high water table is within a depth of 1.5 feet.

Wind erosion.—The wind erodibility group (WEG) is 1 or 2.

Pastureland

Growing legumes, cool-season grasses, and warm-season grasses that are suited to the soils and climate of the area helps to maintain a productive stand of pasture (fig. 11).

Frost heave is a limitation in areas where the soils have a moderate or high potential for frost action. It occurs when ice lenses or bands develop in the soil and drive an ice wedge between two layers of soil near the surface layer. The ice wedges heave the overlying soil layer upward, snapping the roots. Soils that have textures low in content of sand have small pores that hold water and enable ice lenses to form. Selecting adapted forage and hay varieties can reduce the effects of frost heave. Timely deferment of grazing maintains a cover of vegetation on the surface, which insulates the soil and thus helps to minimize the effects of frost heave.

Pastureland soils that are susceptible to water erosion meet the following criteria: The value of the K factor multiplied by the slope is greater than 0.8, and the slope is equal to or greater than 3 percent.

Water erosion reduces the productivity of pastureland. It also results in onsite and offsite sedimentation, causes water pollution by sedimentation, and increases the runoff of livestock manure and other added nutrients.

Measures that are effective in controlling water erosion include establishing or renovating stands of legumes and grasses. Controlling erosion during seedbed preparation is a major concern. If the soil is tilled for the reseeding of pasture or hay crops, planting winter cover crops, establishing grassed waterways, farming on the

Figure 11.—Proper management practices help to maintain the productivity of grass-legume hay in this area of Wauconda and Zurich soils.

contour, and using a system of conservation tillage that leaves a protective cover of crop residue on the surface can help to minimize erosion.

Overgrazing or grazing when the soil is wet reduces the extent of plant cover and results in surface compaction and poor tilth, and thus it increases the susceptibility to erosion. Proper stocking rates, rotation grazing, and timely deferment of grazing, especially during wet periods, help to keep the pasture in good condition. The proper location of livestock watering facilities helps to minimize surface compaction or the formation of ruts by making it unnecessary for cattle to travel long distances up and down the steep slopes.

Wetness and ponding are concerns in some areas used for pasture or hay. Wetness occurs when the seasonal high water table is within a depth of 1.5 feet. Ponding occurs when the water table is above the surface. Drainage systems consist of subsurface tile drains, surface inlet tile, open drainage ditches, or a combination of these. Measures that maintain the drainage system are needed. Selecting species of grasses and legumes that are adapted to wet conditions can improve forage production. Restricting use during wet periods helps to keep the pasture in good condition.

Soils that have low fertility meet the following criteria: The average content of organic matter in the surface layer is less than 1 percent, and the cation-exchange capacity is equal to or less than 7 milliequivalents per 100 grams of soil.

Low fertility levels affect the health and vigor of the plants and thus have a direct impact on the quantity and quality of livestock produced. Additions of fertilizers and other organic material should be based on the results of soil tests, on the needs of specific plant species, and on the desired level of production.

Soils that have low pH, or low reaction, have a pH value equal to or less than 5.5 in the surface layer. Low pH inhibits the uptake of certain nutrients by the plants or accelerates the absorption of certain other elements to the level of toxic concentrations. Either of these conditions affects the health and vigor of plants. Applications of lime should be based on the results of soil tests. The goal is to achieve the optimum pH level for the uptake of the major nutrients by the specific grass, legume, or combination of grasses and legumes.

Excess lime occurs in soils that have a calcium carbonate equivalent of 15 percent or more within a depth of 16 inches. The high pH associated with this limitation can inhibit the uptake of certain nutrients and micronutrients by the plants or accelerates the absorption of certain other elements to the level of toxic concentrations. Either of these conditions affects the health and vigor of plants. Applications of sulfate and phosphate compounds or the addition of certain forms of nitrogen fertilizer can improve forage production.

Some soils have a dense layer of till within a depth of 40 inches. This layer inhibits the penetration of roots. The root-restrictive layer reduces the amount of total water in the soil that is available to plants. Deep-rooted perennial legumes and grasses make the most efficient use of the limited amount of moisture. Selecting drought-tolerant species of grasses and legumes can improve forage production.

Available water capacity is limited when it is a weighted average of less than 0.10 inch of water per inch of soil within a depth of 40 inches or when it is a weighted average of less than 3 inches in the root zone if the root zone is less than 40 inches thick. Available water capacity refers to the capacity of soils to hold water available for use by most plants. The quality and quantity of pasture may be reduced if the available water is inadequate for the maintenance of a healthy community of desired pasture species and thus the desired number of livestock. A poor quality pasture may increase the hazard of erosion and increase the runoff of pollutants. Planting drought-resistant species of grasses and legumes helps to establish a cover of vegetation. The plants should not be clipped or grazed until they are sufficiently established.

In areas where slopes are 10 percent or more, the use of farm equipment may be restricted. Equipment limitations can affect fertilization, harvest, pasture renovation, and seedbed preparation. They cannot be easily overcome.

Soils that have a wind erodibility group (WEG) of 1 or 2 are susceptible to wind erosion. If the soil is tilled for the reseeding of pasture or hay crops, planting winter cover crops, using a system of conservation tillage that leaves crop residue on the surface, and keeping the surface rough help to control wind erosion. Overgrazing or grazing during wet periods reduces the extent of plant cover and thus increases the hazard of wind erosion. Proper stocking rates, rotation grazing, and timely deferment of grazing, especially during wet periods, help to keep the pasture in good condition.

Frequent or occasional flooding can damage forage stands and delay harvesting in some years. Dikes and diversions help to control the extent of damage caused by flooding. Selecting species of grasses and legumes that are adapted to wet conditions can improve forage production. Restricting use during wet periods helps to keep the pasture in good condition.

In areas where the soils have more than 15 percent rock fragments in the surface layer, seedbed preparation and renovation practices may be hindered. This limitation causes rapid wear of tillage equipment. It cannot be easily overcome. Cobbles and stones on the surface can be removed or piled in a corner of the field.

Crop Yield Estimates

Table 7 shows the average yields per acre that can be expected for corn, soybeans, winter wheat, oats, and grass-legume hay under an optimum level of management and for grass-legume pasture under an average level of management. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of the soils also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (Olson and Lang, 2000; Olson and others, 2000). Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage; erosion control; protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The relative productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Pasture yields.—Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in table 7.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not take into account major and generally expensive landshaping that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils generally are grouped at three levels—capability class, subclass, and unit (USDA, 1961). These categories indicate the degree and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, soybeans, small grain, and hay. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use.

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and forestland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7. The local office of the Cooperative Extension Service or the Natural Resources Conservation Service can provide guidance on the use of these soils as cropland.

Areas in class 8 are generally not suited to crops, pasture, or forestland without a level of management that is impractical. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class 1 because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, forestland, wildlife habitat, or recreation.

The capability classification of the soils in the survey area is given in table 7.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

Over the past several decades, a major trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 8. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading “Soil Series and Detailed Soil Map Units.”

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species (fig. 12). Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough

Figure 12.—Hydric indicators, such as shallow water and hydrophytic vegetation, are evident in this area of Houghton muck, ponded, 0 to 2 percent slopes.

during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 2003) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The map units in which one or more components meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators are listed in table 9. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

Forestland Management and Productivity

James Anderson, natural resource manager, Lake County Forest Preserve District, helped prepare this section.

A vegetation map prepared by the Lake County Forest Preserve District shows that, prior to European settlement, the county was 61 percent forested, 23 percent well drained prairie, and 15 percent wetlands. Several forest types occur in Lake County, including flood-plain forests, upland forests, woodlands, flatwoods, and savannas (Lake County Forest Preserve District, 1989; Sullivan, 2001).

The predominant forest type is the savanna community, which is characterized by widely spaced trees (10 to 50 percent cover), a mixture of tall grasses and flowers as ground cover, and various shrubs. In Lake County, because of the densely packed soils, the savannas were typically wetter communities than those in other parts of the Chicago region. Bur oak was the principal tree species, and white oak, black oak, and shagbark hickory also occurred. Typical grasses in the savanna include prairie cordgrass, big bluestem, blue joint grass, wood rush, and lake sedge. Typical flower species included yellow pimpernel, wild onion, prairie dock, Indian paintbrush, and wild sarsaparilla. Typical shrubs include hazelnut and wild plum. Savanna communities are in scattered areas on the landscape near the edges of wetlands, prairies, and woodland and occur on both wet and dry soils.

Upland forest communities have a denser canopy (more than 80 percent) than that of the savanna and made up an estimated 11 percent of the county landscape. Major tree species included red oak, white oak, white ash, and ironwood. The forest floor has a very diverse group of spring wildflowers, including wild geranium, may apple, phlox, and zigzag goldenrod and a variety of sedge and grass species, including bottlebrush grass, silky rye grass, common oak sedge, and curly-styled wood sedge. The soils in these areas are typically moderately well drained and occur on the crests of glacial moraines (fig. 13). Mesic upland forests, which made up 1 percent of the land area, were in ravines and on scattered sand and gravel terraces along the Des Plaines River, where fires were limited. Typical species included sugar maple, basswood, and red oak.

Woodland communities, which are between the savanna and upland forest communities, have a tree canopy of 50 to 80 percent. The typical trees in the woodland community are white oak, red oak, bur oak, shagbark hickory, bitternut hickory, and black walnut. Good quality woodlands have a very good population of sedges and grasses covering the ground layer and a mixture of flowers, including spring wildflowers, asters, and goldenrods. Hazelnut, viburnums, and young oaks make up the shrub layer. Woodland communities tend to occur in flat areas, such as the top of glacial moraines and level areas in the western part of the county. The soils in areas of these communities are both wet and dry.

Flood-plain forests were largely in the low-lying areas along the Des Plaines River. The dominant tree species were silver maple, red maple, green ash, cottonwood, and American elm. The ground layer was covered with a variety of spring wildflowers, sedges, and grasses, which respond to the level of flooding associated with the river. Along the edge of the river are sloughs or backwater areas, where sedge meadowlike

Figure 13.—An upland forest community in an area of Ozaukee silt loam, 4 to 6 percent slopes, eroded.

communities occur. Buttonbush swamps can still be found in these same areas today. The soils associated with this community are typically alluvial soils.

Flatwoods are a very unique type of woodland community. They generally occur atop glacial moraines in areas where the soils have a very high content of clay. The densely packed, clayey soils hinder the movement of water. As a result, vernal pools are created. These pools hold water until it is removed by evapotranspiration. The canopy cover in the flatwoods varies but ranges to as much as 75 percent and has sporadic openings. Typical tree species included swamp white oak and black ash. The dominant shrub species are buttonbush and blue beech. The ground layer is typically dominated by a graminoid community, which is a mix of sedges and grasses. Typical herbaceous species in the vernal ponds include lake sedge, tussock sedge, blue joint grass, common wood reed, blue flag iris, swamp milkweed, false aster, and Michigan lily. This community typically occurs in depressions and drainageways on the top of slopes of glacial moraines.

Several very small areas, estimated to be less than 1 percent of the land area of the county, were forested bogs, a relic community of a more northern forest type. These bogs were in poorly drained acidic depressions scattered in the western half of the county. Eastern larch was the major species, and poison sumac and bog birch also grew in these areas.

The Beach Ridge complex, a diverse environment of former lakeshore dunes with ridges covered by black oak and grasses and intervening swales containing marsh and wet meadow/prairie communities, is estimated to have made up less than 2 percent of the landscape. The Beach Ridge complex included white pine and jack pine in the southern half of its area, along the shore of Lake Michigan in the northeast corner of the county.

Mesic upland forests, which made up 1 percent of the land area, were in ravines and on scattered sand and gravel terraces along the Des Plaines River. Typical species included sugar maple, basswood, and red oak.

A forest inventory based on 1985 aerial photography classified 12 percent of the county (37,110 acres) as forestland. The impact of agriculture and urban development in the last 160 years has greatly reduced the forested areas. Few forested areas of significant size remain outside of public lands, and because of previous grazing and the introduction of invasive species, much of what remains contains young trees of lower quality species. Disease also has taken its toll on forest resources. A study by the Illinois Natural History Survey (Iverson and others, 1989) estimates that between 180 and 274 woody species occur in Lake County. That same study estimated that the county had less than 1,000 acres of commercial woodland.

Assistance in establishing, improving, or managing forestland is available from foresters or natural resource specialists.

Information about the hazards and limitations that should be considered in areas used as forestland are given in tables 10 through 12.

Forestland Harvest Equipment Considerations

Table 10 provides information regarding the use of harvest equipment in areas used as forestland.

For most soils spring is the most limiting season. Alternate thawing and freezing during snowmelt cause saturation and low strength of the surface soil layers. When thawing is complete, saturation continues for short periods in well drained soils to nearly all year in very poorly drained soils in depressions. Degrees of wetness are generally proportionate to the depth at which a seasonal high water table occurs. The water table generally is lower in summer during the heavy use of moisture by vegetation and is nearer the surface during periods when absorbed precipitation is greater than the vegetation requires. Harvesting during periods of saturation usually results in severe soil damage, except when the soil is frozen. The preferred season for timber harvest on many soils is winter, when wetness and low soil strength can be overcome by freezing.

Considerations shown in table 10 are as follows:

Slope.—The upper slope limit is more than 15 percent.

Flooding.—The soil is frequently flooded.

Wetness.—The soil is somewhat poorly drained, poorly drained, or very poorly drained or has a perched seasonal high water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 10 inches.

Rubbly surface.—The word “rubbly” is in the map unit name.

Surface stones.—The words “extremely stony” are in the map unit name.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—Rock outcrop is a named component in the map unit.

Susceptible to rutting and wheel slippage (low strength).—The AASHTO classification is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Poor traction (loose sandy material).—The USDA texture includes sands or loamy sands in any layer at a depth of 10 inches or less.

Forest Haul Road and Log Landing Considerations

Table 11 provides information regarding the use of the soils as haul roads and log landings. Log landings are areas where logs are assembled for transportation. Areas that require little or no cutting, filling, or surface preparation are desired. Haul roads serve as transportation routes from log landings to primary roads. Generally, haul roads are unpaved, but some are graveled.

For haul roads, considerations shown in the table are as follows:

Slope.—The slope is 8 percent or more.

Flooding.—The soil is frequently flooded.

Wetness.—The soil is somewhat poorly drained, poorly drained, or very poorly drained or has a perched seasonal high water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 20 inches.

Depth to soft rock.—The depth to soft bedrock is less than 20 inches.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—Rock outcrop is a named component in the map unit.

Low bearing strength.—The AASHTO classification is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Rubbly surface.—The word “rubbly” is in the map unit name.

For log landings, considerations shown in the table are as follows:

Slope.—The slope is more than 3 percent.

Flooding.—The soil is occasionally flooded or frequently flooded.

Wetness.—The soil is somewhat poorly drained, poorly drained, or very poorly drained or has a perched seasonal high water table (any drainage class).

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—Rock outcrop is a named component in the map unit.

Susceptible to rutting and wheel slippage (low strength).—The AASHTO classification is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Rubbly surface.—The word “rubbly” is in the map unit name.

Forestland Site Preparation and Planting Considerations

Table 12 provides information regarding considerations affecting site preparation and planting in areas used as forestland.

Considerations shown in the table are as follows:

Slope.—The upper slope limit is more than 15 percent.

Flooding.—The soil is frequently flooded.

Wetness.—The soil is somewhat poorly drained, poorly drained, or very poorly drained or has a perched seasonal high water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 20 inches.

Surface stones.—The word “stony” is in the map unit name.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—Rock outcrop is a named component in the map unit.

Water erosion.—The slope is 8 percent or more.

Potential poor tilth and compaction.—The AASHTO classification is A-6 or A-7 in the upper 10 inches.

Rubbly surface.—The word “rubbly” is in the map unit name.

Cobbly surface.—The word “cobbly” is in the map unit name.

Forest Productivity

Table 13 can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils commonly used for wood crops are listed.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 14 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 14 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The numerous lakes for which the county is named offer a variety of recreational activities, including boating, skiing, fishing, and swimming. Other recreational facilities are available throughout the county. The Forest Preserve District is a winner of the National Gold Medal Award. This organization, established in 1958 by public referendum, owns and manages forty forest preserves making up more than 24,000 acres. An assortment of year-round outdoor activities are available to the public, including boating, fishing, hiking, biking, horseback riding, picnicking, swimming, snowmobiling, crosscountry skiing, sledding, and golfing. The county also has several museums and educational and visitor centers managed by the Forest Preserve District.

The county has three State parks: Illinois Beach State Park, Chain O'Lakes State Park, and Volo Bog. Numerous recreational activities are available to the public at these facilities.

Most municipalities in the county offer a variety of recreational services, including playgrounds, swimming pools, and golf courses.

The soils of the survey area are rated in tables 15a and 15b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 15a and 15b can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

James Anderson, natural resource manager, Lake County Forest Preserve District, helped prepare this section.

Lake County's diverse topography, which is primarily the result of glacial action, provides a variety of aquatic and upland habitats that support an abundance of wildlife species. The county has a very diverse collection of natural communities, including sand prairies, sand savannas, wetlands, wet prairies, sedge meadows, fens, bogs, mesic woodlands, flatwoods, flood-plain forests, mesic and dry prairies, and savanna communities. There are 1,440 plant species, of which 1,040 are native, in these natural communities in Lake County. These plant species provide food and shelter for a great variety of wildlife. Lake County has more threatened and endangered species than any other county in Illinois.

Characteristic aquatic habitats include more than 250 small lakes, numerous streams, and wetlands. Typical wetland types include basin marshes, lakeside marshes, glacial potholes or kettle marshes, fens, bogs, hillside seeps, and flood-plain wetlands along streams and rivers. These wetlands provide habitat for several groups of species that typically occur in Lake County. The basin marshes provide habitat for wetland birds, including ducks, herons, rails, geese, and cranes. They also provide habitat for several mammal species, including beaver, muskrat, and mink. The marsh community also provides habitat for several species of amphibians and turtles, including green frog, bullfrog, toads, snapping turtle, and Blanding's turtle. Insect species in the wetland areas include dragonflies, water beetles, water striders, and mosquitoes. These wetland areas provide important stormwater storage and water quality benefits to the county. Sedge meadows and wet prairies provide habitat for species that can live with seasonal inundation, such as rails and a very large suite of butterflies. Because of their unique character of alkaline and acidic community substrate, fens and bogs provide habitat for many endangered and threatened species.

The upland areas, which range from steep to gently sloping hillsides and ridges to nearly level glacial lake beds and outwash plains, were once covered by prairies, savannas, woodlands, and forests. These communities provided habitat for a variety of species, including buffalo, elk, prairie chickens, and wolves. These species are no longer found in Lake County but have been replaced by species that are adapted to areas that have been disturbed by human activity. These species include whitetail deer, pheasants, squirrels, crows, cardinals, house sparrows, raccoon, fox, and coyotes. The open prairie areas, with their large number of flowers, support many insects; several butterflies and leafhoppers; and birds, such as the Henslow sparrow, bobolink, and meadowlark. The savannas, which are characterized by both prairie and woodland species, provide habitat for such species as the eastern bluebird, meadow jumping mouse, redheaded woodpecker, rough green snake, and red-tailed hawk. The woodland community, with its more closed-in canopy, provides habitat for the pileated woodpecker, brown creepers, the woodland jumping mouse, and the box turtle. Woodlands that are dominated by swamp white oak and have small vernal pools provide habitat for several rare amphibians, including the spotted salamander, the spring peeper frog, the four-toed salamander, and a huge variety of aquatic insects and crustaceans, which in turn provide food for sandpipers and wood ducks. The forest community provides habitat for several forest interior bird species that are very rare in Lake County. The wood thrush, blackbilled cuckoo, scarlet tanager, flying squirrel, and longtailed weasel are rare species.

In general, most areas in the county are not managed primarily for wildlife. Good land management practices, however, often improve an area's value for wildlife as well. For example, farm practices that leave crop residue on the fields during the fall and winter not only help to control erosion but also provide winter cover and food for some wildlife species. Allowing grassed waterways, road ditches, fence lines, set-aside fields, and vacant properties to remain unmowed until early August provides much-needed habitat for ground-nesting wildlife, such as rabbits, pheasants, and many species of songbirds. Many temporarily and seasonally flooded wetlands have been impacted by our land use practices. Development and cultivation in these wetlands should be avoided. Buffer strips surrounding wetland areas provide food and nesting cover for many wildlife species and prevent these areas from filling in with eroded sediment. Wetlands, streambanks, and woodlots should be fenced so that livestock are excluded. Fencing protects and maintains the native plant communities that support wildlife species, helps to control erosion, and improves water quality in streams and rivers.

When an area is being restored or managed for wildlife habitat, knowledge of the soils on the site is important. For example, poorly drained and very poorly drained soils have a seasonal high water table and are most likely to support vegetation that is tolerant of wet conditions. This kind of vegetation attracts wetland wildlife species. In some areas of the county, poorly drained and very poorly drained soils have been drained by subsurface tile drains or drainage ditches. Such areas offer opportunities for the restoration of wetland habitat, provided that negative impacts on neighboring properties are avoided.

Restoration in Lake County has been carried out by the Illinois Department of Natural Resources (IDNR), the U.S. Fish and Wildlife Service, Open Space Districts, and the Lake County Forest Preserve. Several restoration efforts have greatly benefited wildlife in the area. The Liberty Prairie Conservancy has protected and restored a rare fen/sedge meadow complex; the IDNR has created the Red Wing Slough, an important area for waterfowl; the Lake Forest Open Lands Association has restored several prairie and savanna communities near Lake Forest; and the Lake County Forest Preserve restored the 1,200-acre Rollins Savanna, which has provided habitat for waterfowl, area-sensitive grassland birds, the Blanding's turtle, and the Franklin's ground squirrel (fig. 14).

Agencies have begun to monitor the wildlife species in the county and have found that several species that become adapted to urban areas are becoming nuisance species as their numbers increase because of the loss of predators, reduced hunting, and the loss of available natural habitat. Displaced wildlife, such as deer, beavers, and raccoons, are appearing in suburban settings. This situation has led to some controversial management issues.

Figure 14.—Former cropland in Rollins Savanna has been restored to its native vegetation and hydrology. As a result, important habitat for openland and wetland wildlife species has been developed.

Assistance with wildlife habitat projects is available from various local, State, and Federal agencies, including the Illinois Department of Natural Resources, the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service, and the local Soil and Water Conservation District.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 16, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading “Soil Properties.”

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Over the last two decades, Lake County has experienced a significant increase in population. This increase has had an important impact on land use.

Urban erosion can be a major factor affecting water quality. It is estimated that the rate of urban erosion and the resulting sediment may be as much as 300 to 400 times the erosion rate in agricultural areas. Urban land under development is commonly stripped for several years without adequate erosion control (fig. 15). Soil compaction

Figure 15.—Unless adequate ground cover is maintained, many urban areas are subject to excessive erosion and sedimentation.

and massive earth moving are more conducive to erosion than is seedbed preparation for crop production.

Urban erosion-control practices utilize essentially the same concepts as those applied to agriculture. The surface of the soil should be protected from the impact of raindrops, and the runoff from accumulated rainwater must be controlled. Effective control of erosion and sediment involves three major elements. First, protecting the soil can be accomplished by maintaining a permanent or temporary vegetative cover, mulching, or using a variety of other practices. Second, runoff can be controlled with conservation practices. These practices include diversions, grassed waterways or lined swales, storm sewers, or gully-control structures. Third, sediment can be captured by using sediment basins, sediment traps, and filter fences (fig. 16).

Erosion-control measures are most effective in combinations. The measures used and their effectiveness depend on the soil characteristics and topography. Information about the design of erosion-control measures is provided in the “Illinois Urban Manual” (USDA, 1995), which is available in local offices of the Natural Resources Conservation Service.

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 17a and 17b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected.

Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that

Figure 16.—A series of sediment basins and filter fences helps to control sedimentation in an area being converted to urban use.

affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Tables 18a and 18b show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Tables 19a and 19b give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 19a, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

In table 19b, the soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, or topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Tables 20a, 20b, and 20c give information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; aquifer-fed excavated ponds; constructing grassed waterways and surface drains; constructing terraces and diversions; drainage; and irrigation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of wind erosion, a low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Drainage is used in some areas to remove excess subsurface and surface water from the soil. The ratings in the table apply to the soil in its undisturbed condition and do not include consideration of current land use. Depth to bedrock, a dense layer, or a cemented pan, the content of large stones, and the content of clay influence the ease of digging, filling, and compacting. A seasonal high water table, ponding, and flooding may restrict the period when excavations can be made. The slope influences the use of machinery. Soil texture and depth to the water table influence the resistance to sloughing. Subsidence of organic layers influences grade and stability of tile drains.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 21 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 22 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 22, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 22, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 22 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook” (USDA, NRCS).

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 23 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 23, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 24 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 24 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

The table also shows the kind of water table—that is, perched or apparent. An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 24 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 25 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which can significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the “National Soil Survey Handbook” (available in local offices of the Natural Resources Conservation Service or on the Internet).

Ablation till. Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Beach deposits. Material, such as sand and gravel, that is generally laid down parallel to an active or relict shoreline of a postglacial or glacial lake.

Beach ridge. A low, essentially continuous mound of beach or beach-and-dune material accumulated by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves or the reach of ordinary tides, and occurring singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of an advancing shoreline.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Bog. Waterlogged, spongy ground, consisting primarily of mosses, containing acidic, decaying vegetation (such as sphagnum, sedges, and heaths) that develops into peat.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression. Any relatively sunken part of the Earth's surface; especially a low-lying area surrounded by higher ground. A closed depression has no natural outlet for surface drainage. An open depression has a natural outlet for surface drainage.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Drift. A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Excess lime (in tables). Excess carbonates in the soil restrict the growth of some plants.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Footslope. The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphology. The science that treats the general configuration of the earth's surface; specifically the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Herbaceous peat. An accumulation of organic material, decomposed to some degree, which is predominantly the remains of sedges, reeds, cattails, and other herbaceous plants.

High-chroma zones. Zones having chroma of 3 or more. Typical color in areas of iron concentrations.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation include:

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Kame. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake bed. The bottom of a lake; a lake basin.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Lakeshore. A narrow strip of land in contact with or bordering a lake; especially the beach of a lake.

Lamella. A thin (commonly less than 1 cm thick), discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been pedogenically concentrated (illuviated within a coarser textured eluviated layer several centimeters to several decimeters thick).

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-chroma zones. Zones having chroma of 2 or less. Typical color in areas of iron depletions.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

MAP. Mean annual precipitation, expressed in inches.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses. See Redoximorphic features.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

MLRA (major land resource area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat. Unconsolidated soil material consisting primarily of organic matter that is in an intermediate stage of decomposition such that a significant part of the material can be recognized and a significant part of the material can not be recognized.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. See Redoximorphic features.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Stratified and sorted sediments (chiefly sand and gravel) removed or "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Parts per million (ppm). The concentration of a substance in the soil, such as phosphorus or potassium, in one million parts of air-dried soil on a weight per weight basis.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:

   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*

   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*

C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.

2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:

A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*

B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).

3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Rise. A slight increase in elevation of the land surface, typically with a broad summit and gently sloping sides.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (K_{sat}). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. The potential decrease in surface elevation as a result of the drainage of wet soils that have organic layers or semifluid, mineral layers. Subsidence, as a result of drainage, is attributed to (1) shrinkage from drying, (2) consolidation because of the loss of ground-water buoyancy, (3) compaction from tillage or manipulation, (4) wind erosion, (5) burning, and (6) biochemical oxidation.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swale. A slight depression in the midst of generally level land. A shallow depression in an undulating ground moraine due to uneven glacial deposition.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth’s surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Waukegan, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	28.7	12.6	20.7	55	-17	0	1.71	0.69	2.73	5	11.3
February---	32.9	16.6	24.8	60	-11	0	1.42	.60	2.12	4	9.2
March------	43.0	26.0	34.5	75	3	12	2.15	.95	3.11	4	5.4
April------	54.3	35.7	45.0	83	18	58	3.70	2.04	5.43	7	1.4
May--------	66.3	46.0	56.2	89	31	219	3.41	1.77	5.03	6	.0
June-------	76.7	55.3	66.0	95	39	478	3.62	1.83	5.14	6	.0
July-------	81.2	61.3	71.3	97	48	649	3.53	2.05	4.90	5	.0
August-----	79.5	60.5	70.0	95	47	617	4.22	2.36	5.88	6	.0
September--	72.4	52.4	62.4	91	35	375	3.40	1.44	4.99	5	.0
October----	61.0	40.9	51.0	83	24	118	2.39	1.27	3.14	4	.1
November---	46.6	30.1	38.3	71	10	18	2.68	1.26	4.08	5	1.9
December---	33.7	18.5	26.1	59	-9	2	2.12	.92	3.13	5	8.0
Yearly:											
Average---	56.4	38.0	47.2	---	---	---	---	---	---	---	---
Extreme---	102	-27	---	98	-18	---	---	---	---	---	---
Total-----	---	---	---	---	---	2,546	34.36	26.87	38.05	62	37.4

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Waukegan, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 16	Apr. 26	May 12
2 years in 10 later than--	Apr. 12	Apr. 22	May 7
5 years in 10 later than--	Apr. 6	Apr. 14	Apr. 28
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 21	Oct. 10	Sept. 27
2 years in 10 earlier than--	Oct. 27	Oct. 15	Oct. 3
5 years in 10 earlier than--	Nov. 8	Oct. 26	Oct. 15

Table 3.--Growing Season

(Recorded in the period 1971-2000 at Waukegan, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	194	174	150
8 years in 10	201	181	157
5 years in 10	216	194	170
2 years in 10	230	207	183
1 year in 10	238	214	190

Table 4.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Haplosaprists
Aptakisic	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Ashkum	Fine, mixed, superactive, mesic Typic Endoaquolls
Barrington	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Beecher	Fine, illitic, mesic Udollic Epiaqualfs
Blount	Fine, illitic, mesic Aeric Epiaqualfs
Bowes	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Boyer	Coarse-loamy, mixed, semiactive, mesic Typic Hapludalfs
Camden	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Casco	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Inceptic Hapludalfs
Del Rey	Fine, illitic, mesic Aeric Epiaqualfs
Dresden	Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Mollic Hapludalfs
Dunham	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Elliott	Fine, illitic, mesic Aquic Argiudolls
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs
Frankfort	Fine, illitic, mesic Udollic Epiaqualfs
Granby	Sandy, mixed, mesic Typic Endoaquolls
Grays	Fine-silty, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs
Grundelein	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Harpster	Fine-silty, mixed, superactive, mesic Typic Calciaquolls
Hooppole	Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls
Houghton	Euic, mesic Typic Haplosaprists
Kish	Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls
Lena	Euic, mesic Typic Haplosaprists
Lorenzo	Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Typic Argiudolls
Markham	Fine, illitic, mesic Mollic Oxyaquic Hapludalfs
Martinsville	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Martinton	Fine, illitic, mesic Aquic Argiudolls
Millbrook	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Millington	Fine-loamy, mixed, superactive, calcareous, mesic Cumulic Endoaquolls
Millstream	Fine-silty, mixed, superactive, mesic Aquollic Hapludalfs
Montgomery	Fine, mixed, active, mesic Vertic Endoaquolls
Mundelein	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Nappanee	Fine, illitic, mesic Aeric Epiaqualfs
Orthents, clayey	Fine, mixed, active, nonacid, mesic Aquic Udorthents
Orthents, loamy	Fine-loamy, mixed, active, nonacid, mesic Oxyaquic Udorthents
Ozaukee	Fine, illitic, mesic Oxyaquic Hapludalfs
Pella	Fine-silty, mixed, superactive, mesic Typic Endoaquolls
Peotone	Fine, smectitic, mesic Cumulic Vertic Endoaquolls
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Rush	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Sawmill	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
*Saylesville	Fine, illitic, mesic Oxyaquic Hapludalfs
Selmass	Fine-loamy, mixed, superactive, mesic Typic Endoaquolls
Udipsamments	Mixed, mesic Aquic Udipsamments and mixed, mesic Typic Udipsamments
Varna	Fine, illitic, mesic Oxyaquic Argiudolls
*Varna	Fine, illitic, mesic Mollic Oxyaquic Hapludalfs
Wauconda	Fine-silty, mixed, superactive, mesic Udollic Endoaqualfs
Zurich	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
23A	Blount silt loam, 0 to 2 percent slopes	1,967	0.7
23B	Blount silt loam, 2 to 4 percent slopes	1,128	0.4
67A	Harpster silty clay loam, 0 to 2 percent slopes	583	0.2
103A	Houghton muck, 0 to 2 percent slopes	6,928	2.3
134A	Camden silt loam, 0 to 2 percent slopes	4	*
134B	Camden silt loam, 2 to 5 percent slopes	15	*
146A	Elliott silt loam, 0 to 2 percent slopes	2,347	0.8
146B	Elliott silt loam, 2 to 4 percent slopes	6,401	2.1
153A	Pella silty clay loam, 0 to 2 percent slopes	14,185	4.7
153A+	Pella silt loam, 0 to 2 percent slopes, overwash	454	0.2
189A	Martinton silt loam, 0 to 2 percent slopes	438	0.1
189B	Martinton silt loam, 2 to 4 percent slopes	434	0.1
192A	Del Rey silt loam, 0 to 2 percent slopes	1,721	0.6
192B	Del Rey silt loam, 2 to 4 percent slopes	325	0.1
219A	Millbrook silt loam, 0 to 2 percent slopes	32	*
223B	Varna silt loam, 2 to 4 percent slopes	4,086	1.4
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	2,874	1.0
228A	Nappanee silt loam, 0 to 2 percent slopes	2,677	0.9
228B	Nappanee silt loam, 2 to 4 percent slopes	5,046	1.7
228B2	Nappanee silty clay loam, 2 to 4 percent slopes, eroded	395	0.1
228C2	Nappanee silty clay loam, 4 to 6 percent slopes, eroded	1,315	0.4
232A	Ashkum silty clay loam, 0 to 2 percent slopes	17,614	5.8
298A	Beecher silt loam, 0 to 2 percent slopes	4,633	1.5
298B	Beecher silt loam, 2 to 4 percent slopes	6,662	2.2
318C2	Lorenzo loam, 4 to 6 percent slopes, eroded	4	*
320A	Frankfort silt loam, 0 to 2 percent slopes	3,386	1.1
320B	Frankfort silt loam, 2 to 4 percent slopes	1,926	0.6
320B2	Frankfort silty clay loam, 2 to 4 percent slopes, eroded	153	*
323B	Casco loam, 2 to 4 percent slopes	108	*
323C2	Casco loam, 4 to 6 percent slopes, eroded	216	*
323D2	Casco loam, 6 to 12 percent slopes, eroded	185	*
323D3	Casco clay loam, 6 to 12 percent slopes, severely eroded	30	*
325A	Dresden silt loam, 0 to 2 percent slopes	747	0.2
325B	Dresden silt loam, 2 to 4 percent slopes	680	0.2
327A	Fox silt loam, 0 to 2 percent slopes	184	*
327B	Fox silt loam, 2 to 4 percent slopes	913	0.3
327C2	Fox silt loam, 4 to 6 percent slopes, eroded	1,144	0.4
327D2	Fox loam, 6 to 12 percent slopes, eroded	1,000	0.3
330A	Peotone silty clay loam, 0 to 2 percent slopes	4,312	1.4
365A	Aptakisic silt loam, 0 to 2 percent slopes	731	0.2
367	Beach sand	442	0.1
370B	Saylesville silt loam, 2 to 4 percent slopes	1,687	0.6
370C2	Saylesville silt loam, 4 to 6 percent slopes, eroded	247	*
442A	Mundelein silt loam, 0 to 2 percent slopes	2,923	1.0
442B	Mundelein silt loam, 2 to 4 percent slopes	560	0.2
443A	Barrington silt loam, 0 to 2 percent slopes	214	*
443B	Barrington silt loam, 2 to 4 percent slopes	825	0.3
465A	Montgomery silty clay loam, 0 to 2 percent slopes	7,743	2.6
488A	Hooppole loam, 0 to 2 percent slopes	21	*
513A	Granby fine sandy loam, 0 to 2 percent slopes	580	0.2
523A	Dunham silty clay loam, 0 to 2 percent slopes	334	0.1
526A	Grundelein silt loam, 0 to 2 percent slopes	497	0.2
530B	Ozaukee silt loam, 2 to 4 percent slopes	30,362	10.1
530B2	Ozaukee silt loam, 2 to 4 percent slopes, eroded	1,009	0.3
530C	Ozaukee silt loam, 4 to 6 percent slopes	6,138	2.0
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	12,153	4.0
530C3	Ozaukee silty clay loam, 4 to 6 percent slopes, severely eroded	404	0.1
530D	Ozaukee silt loam, 6 to 12 percent slopes	1,936	0.6
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	5,599	1.9
530D3	Ozaukee silty clay loam, 6 to 12 percent slopes, severely eroded	1,387	0.5
530E	Ozaukee silt loam, 12 to 20 percent slopes	866	0.3
530E2	Ozaukee silt loam, 12 to 20 percent slopes, eroded	2,639	0.9
530F	Ozaukee silt loam, 20 to 30 percent slopes	2,332	0.8

See footnote at end of table.

Table 5.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
531B	Markham silt loam, 2 to 4 percent slopes	9,488	3.1
531C2	Markham silt loam, 4 to 6 percent slopes, eroded	9,182	3.0
531D2	Markham silt loam, 6 to 12 percent slopes, eroded	1,919	0.6
557A	Millstream silt loam, 0 to 2 percent slopes	302	0.1
570B	Martinsville silt loam, 2 to 4 percent slopes	3	*
570C2	Martinsville silt loam, 4 to 6 percent slopes, eroded	5	*
626A	Kish loam, 0 to 2 percent slopes	273	*
696A	Zurich silt loam, 0 to 2 percent slopes	1,118	0.4
696B	Zurich silt loam, 2 to 4 percent slopes	3,788	1.3
696C2	Zurich silt loam, 4 to 6 percent slopes, eroded	1,925	0.6
696D2	Zurich silt loam, 6 to 12 percent slopes, eroded	934	0.3
697A	Wauconda silt loam, 0 to 2 percent slopes	4,477	1.5
697B	Wauconda silt loam, 2 to 4 percent slopes	526	0.2
698A	Grays silt loam, 0 to 2 percent slopes	2,291	0.8
698B	Grays silt loam, 2 to 4 percent slopes	3,615	1.2
706B	Boyer sandy loam, 2 to 4 percent slopes	1,728	0.6
706C	Boyer sandy loam, 4 to 6 percent slopes	340	0.1
791A	Rush silt loam, 0 to 2 percent slopes	235	*
791B	Rush silt loam, 2 to 4 percent slopes	498	0.2
791C2	Rush silt loam, 4 to 6 percent slopes, eroded	379	0.1
792A	Bowes silt loam, 0 to 2 percent slopes	174	*
792B	Bowes silt loam, 2 to 4 percent slopes	199	*
802B	Orthents, loamy, undulating	6,282	2.1
805B	Orthents, clayey, undulating	3,825	1.3
830	Landfills	1,205	0.4
839B	Udipsamments complex, undulating	1,275	0.4
840B	Zurich and Ozaukee silt loams, 2 to 4 percent slopes	4,054	1.3
840C2	Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	1,698	0.6
865	Pits, gravel	494	0.2
969E2	Casco-Rodman complex, 12 to 20 percent slopes, eroded	621	0.2
969F	Casco-Rodman complex, 20 to 30 percent slopes	612	0.2
978A	Wauconda and Beecher silt loams, 0 to 2 percent slopes	3,551	1.2
978B	Wauconda and Beecher silt loams, 2 to 4 percent slopes	1,360	0.5
979A	Grays and Markham silt loams, 0 to 2 percent slopes	718	0.2
979B	Grays and Markham silt loams, 2 to 4 percent slopes	5,620	1.9
981A	Wauconda and Frankfort silt loams, 0 to 2 percent slopes	2,115	0.7
981B	Wauconda and Frankfort silt loams, 2 to 4 percent slopes	445	0.1
982A	Aptakisic and Nappanee silt loams, 0 to 2 percent slopes	814	0.3
982B	Aptakisic and Nappanee silt loams, 2 to 4 percent slopes	327	0.1
983B	Zurich and Nappanee silt loams, 2 to 4 percent slopes	818	0.3
984B	Barrington and Varna silt loams, 2 to 4 percent slopes	2,630	0.9
989A	Mundelein and Elliott silt loams, 0 to 2 percent slopes	1,615	0.5
989B	Mundelein and Elliott silt loams, 2 to 4 percent slopes	1,765	0.6
1082A	Millington silt loam, undrained, 0 to 2 percent slopes, occasionally flooded	66	*
1103A	Houghton muck, undrained, 0 to 2 percent slopes	6,451	2.1
1107A	Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	4,443	1.5
1210A	Lena muck, undrained, 0 to 2 percent slopes	92	*
1330A	Peotone silty clay loam, undrained, 0 to 2 percent slopes	712	0.2
1529A	Selmass loam, undrained, 0 to 2 percent slopes	22	*
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	277	*
4103A	Houghton muck, ponded, 0 to 2 percent slopes	4,812	1.6
4777A	Adrian muck, ponded, 0 to 2 percent slopes	1,763	0.6
8082A	Millington silt loam, 0 to 2 percent slopes, occasionally flooded	9	*
W	Water	18,664	6.2
	Total	301,435	100.0

* Less than 0.1 percent.

Table 6.--Management Considerations on Cropland and Pastureland

(See text for a description of the considerations listed in this table. Only the map units that are generally available for use as cropland or pastureland are listed. Absence of an entry indicates that the map unit is generally unsuited to use as cropland or pastureland)

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
23A:		
Blount	Wetness, root-restrictive layer, crusting, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
23B:		
Blount	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
67A:		
Harpster	Ponding, poor tilth, excess lime	Ponding, excess lime, frost heave
103A:		
Houghton	Ponding, wind erosion, subsidence	Ponding, wind erosion, frost heave
134A:		
Camden	Crusting	Low pH, frost heave
134B:		
Camden	Crusting, water erosion	Low pH, water erosion, frost heave
146A:		
Elliott	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, frost heave
146B:		
Elliott	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave
153A:		
Pella	Ponding, poor tilth	Ponding, frost heave
153A+:		
Pella	Ponding	Ponding, frost heave
189A:		
Martinton	Wetness	Wetness, frost heave
189B:		
Martinton	Wetness, water erosion	Wetness, water erosion, frost heave
192A:		
Del Rey	Wetness, crusting, restricted permeability	Wetness, low pH, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
192B:		
Del Rey	Wetness, crusting, water erosion, restricted permeability	Wetness, low pH, water erosion, frost heave
219A:		
Millbrook	Wetness	Wetness, low pH, frost heave
223B:		
Varna	Root-restrictive layer, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
223C2:		
Varna	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
228A:		
Nappanee	Wetness, root-restrictive layer, crusting, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
228B:		
Nappanee	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
228B2, 228C2:		
Nappanee	Wetness, root-restrictive layer, poor tilth, water erosion, limited available water capacity, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, limited available water capacity, frost heave
232A:		
Ashkum	Ponding, poor tilth	Ponding, frost heave
298A:		
Beecher	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
298B:		
Beecher	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
318C2:		
Lorenzo	Excess lime, crusting, water erosion, limited available water capacity, excessive permeability	Water erosion, limited available water capacity, excess lime, frost heave
320A:		
Frankfort	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
320B:		
Frankfort	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave
320B2:		
Frankfort	Wetness, root-restrictive layer, poor tilth, water erosion, limited available water capacity, restricted permeability	Wetness, root-restrictive layer, water erosion, limited available water capacity, frost heave
323B, 323C2, 323D2:		
Casco	Crusting, water erosion, limited available water capacity, excessive permeability	Water erosion, limited available water capacity, frost heave
323D3:		
Casco	Poor tilth, water erosion, limited available water capacity, excessive permeability	Water erosion, limited available water capacity, low fertility, frost heave
325A:		
Dresden	Excessive permeability	Frost heave
325B:		
Dresden	Water erosion, excessive permeability	Water erosion, frost heave
327A:		
Fox	Crusting, excessive permeability	Low pH, frost heave
327B, 327C2, 327D2:		
Fox	Crusting, water erosion, excessive permeability	Low pH, water erosion, frost heave
330A:		
Peotone	Ponding, poor tilth	Ponding, frost heave
365A:		
Aptakisic	Wetness, crusting	Wetness, low pH, frost heave
370B, 370C2:		
Saylesville	Crusting, water erosion	Low pH, water erosion, frost heave
442A:		
Mundelein	Wetness	Wetness, frost heave
442B:		
Mundelein	Wetness, water erosion	Wetness, water erosion, frost heave
443A:		
Barrington	No major limitations	Frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
443B:		
Barrington	Water erosion	Water erosion, frost heave
465A:		
Montgomery	Ponding, poor tilth, restricted permeability	Ponding, frost heave
488A:		
Hooppole	Ponding, excess lime, excessive permeability	Ponding, excess lime, frost heave
513A:		
Granby	Ponding, limited available water capacity, excessive permeability	Ponding, limited available water capacity, frost heave
523A:		
Dunham	Ponding, poor tilth, excessive permeability	Ponding, frost heave,
526A:		
Grundelein	Wetness, excessive permeability	Wetness, frost heave
530B, 530B2, 530C, 530C2:		
Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
530C3:		
Ozaukee	Root-restrictive layer, poor tilth, water erosion, restricted permeability	Root-restrictive layer, water erosion, low fertility, frost heave
530D, 530D2:		
Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
530D3:		
Ozaukee	Root-restrictive layer, poor tilth, water erosion, restricted permeability	Root-restrictive layer, water erosion, low fertility, frost heave
530E, 530E2:		
Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Equipment limitation, root-restrictive layer, water erosion, frost heave
530F:		
Ozaukee	---	Equipment limitation, root-restrictive layer, water erosion, frost heave
531B, 531C2, 531D2:		
Markham	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, low pH, water erosion, frost heave
557A:		
Millstream	Wetness, excessive permeability	Wetness, low pH, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
570B, 570C2:		
Martinsville	Water erosion	Low pH, water erosion, frost heave
626A:		
Kish	Ponding, excess lime	Ponding, excess lime, frost heave
696A:		
Zurich	Crusting	Low pH, frost heave
696B, 696C2, 696D2:		
Zurich	Crusting, water erosion	Low pH, water erosion, frost heave
697A:		
Wauconda	Wetness	Wetness, frost heave
697B:		
Wauconda	Wetness, water erosion	Wetness, water erosion, frost heave
698A:		
Grays	No major limitations	Frost heave
698B:		
Grays	Water erosion	Water erosion, frost heave
706B:		
Boyer	Limited available water capacity, excessive permeability	Limited available water capacity, low fertility, frost heave
706C:		
Boyer	Water erosion, limited available water capacity, excessive permeability	Water erosion, limited available water capacity, low fertility, frost heave
791A:		
Rush	Crusting, excessive permeability	Low pH, frost heave
791B:		
Rush	Crusting, water erosion, excessive permeability	Low pH, water erosion, frost heave
791C2:		
Rush	Crusting, water erosion, excessive permeability	Low pH, water erosion, frost heave
792A:		
Bowes	Excessive permeability	Low pH, frost heave
792B:		
Bowes	Water erosion, excessive permeability	Low pH, water erosion, frost heave
802B:		
Orthents, loamy	Crusting, water erosion	Water erosion, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
805B:		
Orthents, clayey	Poor tilth, water erosion, limited available water capacity, restricted permeability	Water erosion, limited available water capacity, frost heave
839B:		
Udipsamments, Typic	---	Wind erosion, limited available water capacity, low fertility, excess lime
Udipsamments, Aquic	Wetness, wind erosion, limited available water capacity, excessive permeability	Wetness, wind erosion, limited available water capacity, low fertility
840B, 840C2:		
Zurich	Crusting, water erosion	Low pH, water erosion, frost heave
Ozaukee	Root-restrictive layer, crusting, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
969E2:		
Casco	---	Equipment limitation, water erosion, limited available water capacity, frost heave
Rodman	---	Equipment limitation, water erosion, limited available water capacity, excess lime, surface rock fragments
978A:		
Wauconda	Wetness	Wetness, frost heave
Beecher	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
978B:		
Wauconda	Wetness, water erosion	Wetness, water erosion, frost heave
Beecher	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
979A:		
Grays	No major limitations	Frost heave
Markham	Root-restrictive layer, restricted permeability	Root-restrictive layer, low pH, frost heave
979B:		
Grays	Water erosion	Water erosion, frost heave
Markham	Root-restrictive layer, water erosion, restricted permeability	Root-restrictive layer, low pH, water erosion, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
981A:		
Wauconda	Wetness	Wetness, frost heave
Frankfort	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, frost heave
981B:		
Wauconda	Wetness, water erosion	Wetness, water erosion, frost heave
Frankfort	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave
982A:		
Aptakisic	Wetness, crusting	Wetness, low pH, frost heave
Nappanee	Wetness, root-restrictive layer, crusting, restricted permeability	Wetness, root-restrictive layer, low pH, frost heave
982B:		
Aptakisic	Wetness, crusting, water erosion	Wetness, low pH, water erosion, frost heave
Nappanee	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
983B:		
Zurich	Crusting, water erosion	Low pH, water erosion, frost heave
Nappanee	Wetness, root-restrictive layer, crusting, water erosion, restricted permeability	Wetness, root-restrictive layer, low pH, water erosion, frost heave
984B:		
Barrington	Water erosion	Water erosion, frost heave
Varna	Root-restrictive layer, water erosion, restricted permeability	Root-restrictive layer, water erosion, frost heave
989A:		
Mundelein	Wetness	Wetness, frost heave
Elliott	Wetness, root-restrictive layer, restricted permeability	Wetness, root-restrictive layer, frost heave
989B:		
Mundelein	Wetness, water erosion	Wetness, water erosion, frost heave
Elliott	Wetness, root-restrictive layer, water erosion, restricted permeability	Wetness, root-restrictive layer, water erosion, frost heave

Table 6.--Management Considerations on Cropland and Pastureland--Continued

Soil name and map symbol	Management considerations on cropland	Management considerations on pastureland
3107A:		
Sawmill	Flooding, ponding, poor tilth	Flooding, ponding, frost heave
8082A:		
Millington	Flooding, ponding, excess lime	Flooding, ponding, excess lime, frost heave

Table 7.--Land Capability and Yields per Acre of Crops and Pasture

(Yields for corn, soybeans, winter wheat, oats, and grass-legume hay are those that can be expected under an optimum level of management. Yields for grass-legume pasture are those that can be expected under an average level of management. All yields are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
23A:							
Blount	2w	125	43	52	59	4.0	5.8
23B:							
Blount	2e	124	43	51	58	4.0	5.8
67A:							
Harpster	2w	164	52	61	80	4.9	7.2
103A:							
Houghton	3w	158	52	---	---	---	7.0
134A:							
Camden	1	149	46	58	78	4.3	6.3
134B:							
Camden	2e	148	46	57	77	4.3	6.3
146A:							
Elliott	2w	151	50	61	78	4.5	6.7
146B:							
Elliott	2e	149	50	60	77	4.5	6.6
153A:							
Pella	2w	165	54	63	82	4.8	7.0
153A+:							
Pella	2w	163	53	62	81	4.7	6.9
189A:							
Martinton	2w	156	52	63	79	4.9	7.2
189B:							
Martinton	2e	154	51	62	78	4.9	7.1
192A:							
Del Rey	2w	136	45	55	67	4.2	6.2
192B:							
Del Rey	2e	135	45	54	66	4.2	6.1
219A:							
Millbrook	2w	159	50	62	84	4.8	7.0
223B:							
Varna	2e	141	45	57	70	4.4	6.4
223C2:							
Varna	3e	133	42	55	67	4.1	6.1
228A:							
Nappanee	3w	104	37	41	44	3.6	5.3
228B:							
Nappanee	3e	103	37	41	44	3.6	5.2

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
228B2:							
Nappanee------------	3e	97	34	38	41	3.3	4.9
228C2:							
Nappanee------------	3e	96	34	38	40	3.3	4.8
232A:							
Ashkum--------------	2w	154	51	59	77	4.6	6.8
298A:							
Beecher-------------	2w	137	46	55	71	4.2	6.2
298B:							
Beecher-------------	2e	136	46	54	70	4.2	6.1
318C2:							
Lorenzo-------------	3e	119	39	48	58	2.8	4.1
320A:							
Frankfort-----------	3w	120	41	52	55	3.6	5.3
320B:							
Frankfort-----------	3e	119	41	51	54	3.6	5.2
320B2:							
Frankfort-----------	3e	112	38	48	51	3.3	4.9
323B:							
Casco---------------	3e	125	41	50	58	2.6	3.8
323C2:							
Casco---------------	3e	116	38	46	54	2.4	3.5
323D2:							
Casco---------------	4e	111	36	44	52	2.3	3.3
323D3:							
Casco---------------	6e	---	---	---	---	1.9	2.7
325A:							
Dresden-------------	2s	142	46	55	73	3.7	5.5
325B:							
Dresden-------------	2e	141	46	54	72	3.7	5.4
327A:							
Fox-----------------	2s	134	43	53	66	3.2	4.7
327B:							
Fox-----------------	2e	133	43	52	65	3.2	4.6
327C2:							
Fox-----------------	2e	126	40	50	62	3.0	4.4
327D2:							
Fox-----------------	3e	123	40	49	61	2.9	4.2
330A:							
Peotone-------------	2w	148	49	55	70	4.5	6.7
365A:							
Aptakisic-----------	2w	140	45	54	71	4.4	6.5

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
367. Beach sand							
370B: Saylesville---------	2e	127	43	52	61	3.6	5.3
370C2: Saylesville---------	2e	120	40	50	58	3.4	5.0
442A: Mundelein-----------	1	169	54	67	89	4.9	7.2
442B: Mundelein-----------	2e	167	53	66	88	4.9	7.1
443A: Barrington----------	1	158	51	62	85	5.3	7.8
443B: Barrington----------	2e	156	50	61	84	5.2	7.8
465A: Montgomery----------	3w	133	44	52	61	4.1	6.0
488A: Hooppole------------	2w	147	48	58	70	4.5	6.7
513A: Granby--------------	3w	131	47	57	61	4.0	5.8
523A: Dunham--------------	2w	160	52	62	81	4.8	7.0
526A: Grundelein----------	1	168	55	64	88	4.8	7.0
530B: Ozaukee-------------	2e	134	42	53	71	3.4	5.0
530B2: Ozaukee-------------	2e	128	40	51	68	3.2	4.8
530C: Ozaukee-------------	2e	132	41	53	71	3.3	4.9
530C2: Ozaukee-------------	2e	127	39	51	68	3.2	4.7
530C3: Ozaukee-------------	3e	117	37	47	63	3.0	4.3
530D: Ozaukee-------------	3e	130	40	52	69	3.3	4.8
530D2: Ozaukee-------------	3e	124	39	50	66	3.1	4.5
530D3: Ozaukee-------------	4e	115	36	46	61	2.9	4.1
530E: Ozaukee-------------	4e	120	37	48	64	3.0	4.4

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
530E2:							
Ozaukee-------------	4e	113	35	45	60	2.9	4.1
530F:							
Ozaukee-------------	6e	---	---	---	---	2.6	3.7
531B:							
Markham-------------	2e	139	45	54	70	3.7	5.4
531C2:							
Markham-------------	3e	132	42	52	67	3.5	5.2
531D2:							
Markham-------------	3e	129	41	51	65	3.4	5.0
557A:							
Millstream----------	1	161	51	62	84	4.6	6.8
570B:							
Martinsville--------	2e	139	44	56	67	4.1	5.9
570C2:							
Martinsville--------	2e	132	41	54	64	3.9	5.6
626A:							
Kish----------------	2w	153	48	59	76	4.6	6.8
696A:							
Zurich--------------	1	147	46	54	70	4.0	5.8
696B:							
Zurich--------------	2e	146	46	53	69	4.0	5.8
696C2:							
Zurich--------------	3e	138	43	51	66	3.8	5.5
696D2:							
Zurich--------------	3e	135	42	50	64	3.7	5.3
697A:							
Wauconda------------	2w	163	51	60	85	5.3	7.8
697B:							
Wauconda------------	2e	161	50	59	84	5.2	7.8
698A:							
Grays---------------	1	151	49	59	78	4.6	6.8
698B:							
Grays---------------	2e	149	49	58	77	4.6	6.8
706B:							
Boyer---------------	3s	120	40	47	53	2.7	4.0
706C:							
Boyer---------------	3e	119	39	46	53	2.6	3.9
791A:							
Rush----------------	1	159	49	61	82	5.5	8.2
791B:							
Rush----------------	2e	157	49	60	81	5.4	8.1

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
791C2:							
Rush----------------	2e	149	46	57	77	5.2	7.7
792A:							
Bowes---------------	1	159	50	63	86	5.6	8.3
792B:							
Bowes---------------	2e	157	50	62	85	5.5	8.3
802B:							
Orthents, loamy-----	2e	93	32	35	55	3.7	4.7
805B:							
Orthents, clayey----	3e	84	29	31	51	3.3	4.2
830.							
Landfills							
839B-----------------		93	33	36	41	3.1	4.5
Udipsamments, Typic	6s						
Udipsamments, Aquic	4s						
840B-----------------		140	44	53	70	3.7	5.4
Zurich--------------	2e						
Ozaukee-------------	2e						
840C2----------------		132	41	51	67	3.5	5.1
Zurich--------------	3e						
Ozaukee-------------	2e						
865.							
Pits, gravel							
969E2----------------		---	---	---	---	2.3	3.4
Casco---------------	6e						
Rodman--------------	6s						
969F-----------------		---	---	---	---	---	3.0
Casco---------------	7e						
Rodman--------------	7s						
978A-----------------		150	48	58	78	4.8	7.0
Wauconda------------	2w						
Beecher-------------	2w						
978B-----------------		148	48	56	77	4.7	6.9
Wauconda------------	2e						
Beecher-------------	2e						
979A-----------------		146	47	57	74	4.2	6.2
Grays---------------	1						
Markham-------------	2s						
979B-----------------		144	47	56	73	4.2	6.1
Grays---------------	2e						
Markham-------------	2e						

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
981A----------------		144	46	56	72	4.5	6.7
Wauconda-----------	2w						
Frankfort----------	3w						
981B----------------		142	46	55	71	4.5	6.6
Wauconda-----------	2e						
Frankfort----------	3e						
982A----------------		124	41	48	59	4.0	6.0
Aptakisic----------	2w						
Nappanee-----------	3w						
982B----------------		123	41	48	58	4.0	5.9
Aptakisic----------	2e						
Nappanee-----------	3e						
983B----------------		127	42	48	58	3.8	5.5
Zurich-------------	2e						
Nappanee-----------	3e						
984B----------------		148	48	59	77	4.8	7.1
Barrington---------	2e						
Varna--------------	2e						
989A----------------		160	52	64	84	4.7	7.0
Mundelein----------	1						
Elliott------------	2w						
989B----------------		158	52	63	82	4.7	6.8
Mundelein----------	2e						
Elliott------------	2e						
1082A:							
Millington---------	5w	---	---	---	---	---	---
1103A:							
Houghton-----------	5w	---	---	---	---	---	---
1107A:							
Sawmill------------	5w	---	---	---	---	---	---
1210A:							
Lena---------------	5w	---	---	---	---	---	---
1330A:							
Peotone------------	5w	---	---	---	---	---	---
1529A:							
Selmass------------	5w	---	---	---	---	---	---
3107A:							
Sawmill------------	3w	153	49	58	78	4.7	6.9
4103A:							
Houghton-----------	8w	---	---	---	---	---	---
4777A:							
Adrian-------------	8w	---	---	---	---	---	---

See footnote at end of table.

Table 7.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Winter wheat	Oats	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
8082A:							
Millington----------	2w	154	49	59	71	4.6	6.8

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 8.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
23A	Blount silt loam, 0 to 2 percent slopes (where drained)
23B	Blount silt loam, 2 to 4 percent slopes
67A	Harpster silty clay loam, 0 to 2 percent slopes (where drained)
134A	Camden silt loam, 0 to 2 percent slopes
134B	Camden silt loam, 2 to 5 percent slopes
146A	Elliott silt loam, 0 to 2 percent slopes
146B	Elliott silt loam, 2 to 4 percent slopes
153A	Pella silty clay loam, 0 to 2 percent slopes (where drained)
153A+	Pella silt loam, 0 to 2 percent slopes, overwash (where drained)
189A	Martinton silt loam, 0 to 2 percent slopes
189B	Martinton silt loam, 2 to 4 percent slopes
192A	Del Rey silt loam, 0 to 2 percent slopes (where drained)
192B	Del Rey silt loam, 2 to 4 percent slopes
219A	Millbrook silt loam, 0 to 2 percent slopes (where drained)
223B	Varna silt loam, 2 to 4 percent slopes
223C2	Varna silt loam, 4 to 6 percent slopes, eroded
228A	Nappanee silt loam, 0 to 2 percent slopes (where drained)
228B	Nappanee silt loam, 2 to 4 percent slopes
228B2	Nappanee silty clay loam, 2 to 4 percent slopes, eroded
232A	Ashkum silty clay loam, 0 to 2 percent slopes (where drained)
298A	Beecher silt loam, 0 to 2 percent slopes (where drained)
298B	Beecher silt loam, 2 to 4 percent slopes
320A	Frankfort silt loam, 0 to 2 percent slopes (where drained)
320B	Frankfort silt loam, 2 to 4 percent slopes
320B2	Frankfort silty clay loam, 2 to 4 percent slopes, eroded
325A	Dresden silt loam, 0 to 2 percent slopes
325B	Dresden silt loam, 2 to 4 percent slopes
327A	Fox silt loam, 0 to 2 percent slopes
327B	Fox silt loam, 2 to 4 percent slopes
327C2	Fox silt loam, 4 to 6 percent slopes, eroded
330A	Peotone silty clay loam, 0 to 2 percent slopes (where drained)
365A	Aptakisic silt loam, 0 to 2 percent slopes (where drained)
370B	Saylesville silt loam, 2 to 4 percent slopes
370C2	Saylesville silt loam, 4 to 6 percent slopes, eroded
442A	Mundelein silt loam, 0 to 2 percent slopes
442B	Mundelein silt loam, 2 to 4 percent slopes
443A	Barrington silt loam, 0 to 2 percent slopes
443B	Barrington silt loam, 2 to 4 percent slopes
465A	Montgomery silty clay loam, 0 to 2 percent slopes (where drained)
488A	Hooppole loam, 0 to 2 percent slopes (where drained)
523A	Dunham silty clay loam, 0 to 2 percent slopes (where drained)
526A	Grundelein silt loam, 0 to 2 percent slopes
530B	Ozaukee silt loam, 2 to 4 percent slopes
530B2	Ozaukee silt loam, 2 to 4 percent slopes, eroded
530C	Ozaukee silt loam, 4 to 6 percent slopes
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded
531B	Markham silt loam, 2 to 4 percent slopes
531C2	Markham silt loam, 4 to 6 percent slopes, eroded
557A	Millstream silt loam, 0 to 2 percent slopes
570B	Martinsville silt loam, 2 to 4 percent slopes
570C2	Martinsville silt loam, 4 to 6 percent slopes, eroded
626A	Kish loam, 0 to 2 percent slopes (where drained)
696A	Zurich silt loam, 0 to 2 percent slopes
696B	Zurich silt loam, 2 to 4 percent slopes
697A	Wauconda silt loam, 0 to 2 percent slopes (where drained)
697B	Wauconda silt loam, 2 to 4 percent slopes
698A	Grays silt loam, 0 to 2 percent slopes
698B	Grays silt loam, 2 to 4 percent slopes
706B	Boyer sandy loam, 2 to 4 percent slopes

Table 8.--Prime Farmland--Continued

Map symbol	Soil name
706C	Boyer sandy loam, 4 to 6 percent slopes
791A	Rush silt loam, 0 to 2 percent slopes
791B	Rush silt loam, 2 to 4 percent slopes
792A	Bowes silt loam, 0 to 2 percent slopes
792B	Bowes silt loam, 2 to 4 percent slopes
840B	Zurich and Ozaukee silt loams, 2 to 4 percent slopes
978A	Wauconda and Beecher silt loams, 0 to 2 percent slopes (where drained)
978B	Wauconda and Beecher silt loams, 2 to 4 percent slopes
979A	Grays and Markham silt loams, 0 to 2 percent slopes
979B	Grays and Markham silt loams, 2 to 4 percent slopes
981A	Wauconda and Frankfort silt loams, 0 to 2 percent slopes (where drained)
981B	Wauconda and Frankfort silt loams, 2 to 4 percent slopes
982A	Aptakisic and Nappanee silt loams, 0 to 2 percent slopes (where drained)
982B	Aptakisic and Nappanee silt loams, 2 to 4 percent slopes
983B	Zurich and Nappanee silt loams, 2 to 4 percent slopes
984B	Barrington and Varna silt loams, 2 to 4 percent slopes
989A	Mundelein and Elliott silt loams, 0 to 2 percent slopes
989B	Mundelein and Elliott silt loams, 2 to 4 percent slopes
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
8082A	Millington silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)

Table 9.--Hydric Soils

(Only the map units that have hydric components are listed. See text for a description of hydric qualities)

Map symbol and map unit name	Component	Hydric status	Local landform
23A:			
Blount silt loam, 0 to 2 percent slopes	Blount	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
23B:			
Blount silt loam, 2 to 4 percent slopes	Blount	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
67A:			
Harpster silty clay loam, 0 to 2 percent slopes	Harpster	Yes	outwash plain, ground moraine, lake plain
103A:			
Houghton muck, 0 to 2 percent slopes	Houghton	Yes	ground moraine, outwash plain, end moraine
134A:			
Camden silt loam, 0 to 2 percent slopes	Camden	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
134B:			
Camden silt loam, 2 to 5 percent slopes	Camden	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
146A:			
Elliott silt loam, 0 to 2 percent slopes	Elliott	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
146B:			
Elliott silt loam, 2 to 4 percent slopes	Elliott	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
153A:			
Pella silty clay loam, 0 to 2 percent slopes	Pella	Yes	outwash plain, ground moraine, lake plain
153A+:			
Pella silt loam, 0 to 2 percent slopes, overwash	Pella	Yes	end moraine, ground moraine, outwash plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
189A:			
Martinton silt loam, 0 to 2 percent slopes	Martinton	No	lake plain
	Ashkum	Yes	ground moraine, end moraine
189B:			
Martinton silt loam, 2 to 4 percent slopes	Martinton	No	lake plain
	Ashkum	Yes	ground moraine, end moraine
192A:			
Del Rey silt loam, 0 to 2 percent slopes	Del Rey	No	lake plain
	Ashkum	Yes	ground moraine, end moraine
	Montgomery	Yes	lake plain
192B:			
Del Rey silt loam, 2 to 4 percent slopes	Del Rey	No	lake plain
	Ashkum	Yes	ground moraine, end moraine
	Montgomery	Yes	lake plain
219A:			
Millbrook silt loam, 0 to 2 percent slopes	Millbrook	No	outwash plain, stream terrace terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
223B:			
Varna silt loam, 2 to 4 percent slopes	Varna	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
223C2:			
Varna silt loam, 4 to 6 percent slopes, eroded	Varna	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
228A:			
Nappanee silt loam, 0 to 2 percent slopes	Nappanee	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
228B:			
Nappanee silt loam, 2 to 4 percent slopes	Nappanee	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
228B2:			
Nappanee silty clay loam, 2 to 4 percent slopes, eroded	Nappanee	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
228C2:			
Nappanee silty clay loam, 4 to 6 percent slopes, eroded	Nappanee	No	ground moraine, end moraine
	Montgomery	Yes	lake plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
232A:			
Ashkum silty clay loam, 0 to 2 percent slopes	Ashkum	Yes	ground moraine, end moraine
298A:			
Beecher silt loam, 0 to 2 percent slopes	Beecher	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
298B:			
Beecher silt loam, 2 to 4 percent slopes	Beecher	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
318C2:			
Lorenzo loam, 4 to 6 percent slopes, eroded	Lorenzo	No	outwash plain, end moraine, kame
	Dunham	Yes	outwash plain, stream terrace
320A:			
Frankfort silt loam, 0 to 2 percent slopes	Frankfort	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
320B:			
Frankfort silt loam, 2 to 4 percent slopes	Frankfort	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
320B2:			
Frankfort silty clay loam, 2 to 4 percent slopes, eroded	Frankfort	No	ground moraine, end moraine
	Montgomery	Yes	lake plain
323B:			
Casco loam, 2 to 4 percent slopes	Casco	No	outwash plain, end moraine, kame
	Dunham	Yes	outwash plain, stream terrace
323C2:			
Casco loam, 4 to 6 percent slopes, eroded	Casco	No	outwash plain, end moraine, kame
	Dunham	Yes	outwash plain, stream terrace
323D2:			
Casco loam, 6 to 12 percent slopes, eroded	Casco	No	outwash plain, end moraine, kame
	Dunham	Yes	outwash plain, stream terrace
323D3:			
Casco clay loam, 6 to 12 percent slopes, severely eroded	Casco	No	outwash plain, end moraine, kame
	Dunham	Yes	outwash plain, stream terrace

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
325A:			
Dresden silt loam, 0 to 2 percent slopes	Dresden	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
325B:			
Dresden silt loam, 2 to 4 percent slopes	Dresden	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
327A:			
Fox silt loam, 0 to 2 percent slopes	Fox	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
327B:			
Fox silt loam, 2 to 4 percent slopes	Fox	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
327C2:			
Fox silt loam, 4 to 6 percent slopes, eroded	Fox	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
327D2:			
Fox loam, 6 to 12 percent slopes, eroded	Fox	No	outwash plain, stream terrace, kame
	Dunham	Yes	outwash plain, stream terrace
330A:			
Peotone silty clay loam, 0 to 2 percent slopes	Peotone	Yes	ground moraine
365A:			
Aptakisic silt loam, 0 to 2 percent slopes	Aptakisic	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
370B:			
Saylesville silt loam, 2 to 4 percent slopes	Saylesville	No	lake plain
	Ashkum	Yes	ground moraine, end moraine
370C2:			
Saylesville silt loam, 4 to 6 percent slopes, eroded	Saylesville	No	lake plain
	Ashkum	Yes	ground moraine, end moraine

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
442A:			
Mundelein silt loam, 0 to 2 percent slopes	Mundelein	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
442B:			
Mundelein silt loam, 2 to 4 percent slopes	Mundelein	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
443A:			
Barrington silt loam, 0 to 2 percent slopes	Barrington	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
443B:			
Barrington silt loam, 2 to 4 percent slopes	Barrington	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, ground moraine, lake plain
465A:			
Montgomery silty clay loam, 0 to 2 percent slopes	Montgomery	Yes	lake plain
488A:			
Hooppole loam, 0 to 2 percent slopes	Hooppole	Yes	outwash plain, stream terrace
513A:			
Granby fine sandy loam, 0 to 2 percent slopes	Granby	Yes	outwash plain, lake terrace
523A:			
Dunham silty clay loam, 0 to 2 percent slopes	Dunham	Yes	outwash plain, stream terrace
526A:			
Grundelein silt loam, 0 to 2 percent slopes	Grundelein	No	outwash plain, stream terrace
	Dunham	Yes	outwash plain, stream terrace
530B:			
Ozaukee silt loam, 2 to 4 percent slopes	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530B2:			
Ozaukee silt loam, 2 to 4 percent slopes, eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
530C:			
Ozaukee silt loam, 4 to 6 percent slopes	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530C2:			
Ozaukee silt loam, 4 to 6 percent slopes, eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530C3:			
Ozaukee silty clay loam, 4 to 6 percent slopes, severely eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530D:			
Ozaukee silt loam, 6 to 12 percent slopes	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530D2:			
Ozaukee silt loam, 6 to 12 percent slopes, eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530D3:			
Ozaukee silty clay loam, 6 to 12 percent slopes, severely eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530E:			
Ozaukee silt loam, 12 to 20 percent slopes	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530E2:			
Ozaukee silt loam, 12 to 20 percent slopes, eroded	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
530F:			
Ozaukee silt loam, 20 to 30 percent slopes	Ozaukee	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
531B:			
Markham silt loam, 2 to 4 percent slopes	Markham	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
531C2:			
Markham silt loam, 4 to 6 percent slopes, eroded	Markham	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
531D2:			
Markham silt loam, 6 to 12 percent slopes, eroded	Markham	No	ground moraine, end moraine
	Ashkum	Yes	ground moraine, end moraine
557A:			
Millstream silt loam, 0 to 2 percent slopes	Millstream	No	outwash plain, stream terrace
	Dunham	Yes	outwash plain, stream terrace
570B:			
Martinsville silt loam, 2 to 4 percent slopes	Martinsville	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, moraine, ground lake plain
570C2:			
Martinsville silt loam, 4 to 6 percent slopes, eroded	Martinsville	No	outwash plain, stream terrace
	Pella	Yes	outwash plain, moraine, ground lake plain
626A:			
Kish loam, 0 to 2 percent slopes	Kish	Yes	outwash plain, stream terrace, ground moraine
696A:			
Zurich silt loam, 0 to 2 percent slopes	Zurich	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
696B:			
Zurich silt loam, 2 to 4 percent slopes	Zurich	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
696C2:			
Zurich silt loam, 4 to 6 percent slopes, eroded	Zurich	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
696D2:			
Zurich silt loam, 6 to 12 percent slopes, eroded	Zurich	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
697A:			
Wauconda silt loam, 0 to 2 percent slopes	Wauconda	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
697B:			
Wauconda silt loam, 2 to 4 percent slopes	Wauconda	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
698A:			
Grays silt loam, 0 to 2 percent slopes	Grays	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
698B:			
Grays silt loam, 2 to 4 percent slopes	Grays	No	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
706B:			
Boyer sandy loam, 2 to 4 percent slopes	Boyer	No	outwash plain, lake terrace
	Dunham	Yes	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
706C:			
Boyer sandy loam, 4 to 6 percent slopes	Boyer	No	outwash plain, lake terrace
	Dunham	Yes	outwash plain, stream terrace,
	Pella	Yes	outwash plain, moraine, ground lake plain
791A:			
Rush silt loam, 0 to 2 percent slopes	Rush	No	outwash plain, stream terrace,
	Dunham	Yes	outwash plain, stream terrace,
791B:			
Rush silt loam, 2 to 4 percent slopes	Rush	No	outwash plain, stream terrace,
	Dunham	Yes	outwash plain, stream terrace,
791C2:			
Rush silt loam, 4 to 6 percent slopes, eroded	Rush	No	outwash plain, stream terrace,
	Dunham	Yes	outwash plain, stream terrace,

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
792A:			
Bowes silt loam, 0 to 2 percent slopes	Bowes	No	outwash plain, stream terrace,
	Dunham	Yes	outwash plain, stream terrace,
792B:			
Bowes silt loam, 2 to 4 percent slopes	Bowes	No	outwash plain, stream terrace,
	Dunham	Yes	outwash plain, stream terrace,
802B:			
Orthents, loamy, undulating	Orthents, loamy	No	outwash plain, ground moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
805B:			
Orthents, clayey, undulating	Orthents, clayey	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Houghton	Yes	ground moraine, outwash plain
	Peotone	Yes	ground moraine
839B:			
Udipsamments complex, undulating	Udipsamments, Typic	No	beach ridge, beach terrace
	Udipsamments, Aquic	No	beach terrace, beach ridge
	Granby	Yes	outwash plain, lake terrace
	Adrian	Yes	beach terrace, lake terrace
840B:			
Zurich and Ozaukee silt loams, 2 to 4 percent slopes	Zurich	No	outwash plain, lake plain
	Ozaukee	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
840C2:			
Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	Zurich	No	outwash plain, lake plain
	Ozaukee	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
865:			
Pits, gravel	Pits, gravel	---	---
	Dunham	Yes	outwash plain, stream terrace
969E2:			
Casco-Rodman complex, 12 to 20 percent slopes, eroded	Casco	No	end moraine, kame, outwash plain
	Rodman	No	end moraine, kame, outwash plain
	Dunham	Yes	outwash plain, stream terrace
969F:			
Casco-Rodman complex, 20 to 30 percent slopes	Casco	No	end moraine, kame, outwash plain
	Rodman	No	end moraine, kame, outwash plain
	Dunham	Yes	outwash plain, stream terrace
978A:			
Wauconda and Beecher silt loams, 0 to 2 percent slopes	Wauconda	No	outwash plain, lake plain
	Beecher	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
978B:			
Wauconda and Beecher silt loams, 2 to 4 percent slopes	Wauconda	No	outwash plain, lake plain
	Beecher	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
979A:			
Grays and Markham silt loams, 0 to 2 percent slopes	Grays	No	outwash plain, lake plain
	Markham	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
979B:			
Grays and Markham silt loams, 2 to 4 percent slopes	Grays	No	outwash plain, lake plain
	Markham	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
981A:			
Wauconda and Frankfort silt loams, 0 to 2 percent slopes	Wauconda	No	outwash plain, lake plain
	Frankfort	No	ground moraine, lake plain
	Montgomery	Yes	lake plain
981B:			
Wauconda and Frankfort silt loams, 2 to 4 percent slopes	Wauconda	No	outwash plain, lake plain
	Frankfort	No	ground moraine, lake plain
	Montgomery	Yes	lake plain
982A:			
Aptakisic and Nappanee silt loams, 0 to 2 percent slopes	Aptakisic	No	outwash plain, lake plain
	Nappanee	No	ground moraine, lake plain
	Montgomery	Yes	lake plain
982B:			
Aptakisic and Nappanee silt loams, 2 to 4 percent slopes	Aptakisic	No	outwash plain, lake plain
	Nappanee	No	ground moraine, lake plain
	Montgomery	Yes	lake plain
983B:			
Zurich and Nappanee silt loams, 2 to 4 percent slopes	Zurich	No	outwash plain, lake plain
	Nappanee	No	ground moraine, lake plain
	Montgomery	Yes	lake plain
984B:			
Barrington and Varna silt loams, 2 to 4 percent slopes	Barrington	No	outwash plain, lake plain
	Varna	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
989A:			
Mundelein and Elliott silt loams, 0 to 2 percent slopes	Mundelein	No	outwash plain, lake plain
	Elliott	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Hydric status	Local landform
989B:			
Mundelein and Elliott silt loams, 2 to 4 percent slopes	Mundelein	No	outwash plain, lake plain
	Elliott	No	ground moraine, lake plain
	Ashkum	Yes	ground moraine, end moraine
	Pella	Yes	outwash plain, moraine, ground lake plain
1082A:			
Millington silt loam, undrained, 0 to 2 percent slopes, occasionally flooded	Millington	Yes	flood plain
1103A:			
Houghton muck, undrained, 0 to 2 percent slopes	Houghton	Yes	ground moraine, outwash
1107A:			
Sawmill silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded	Sawmill	Yes	flood plain
1210A:			
Lena muck, undrained, 0 to 2 percent slopes	Lena	Yes	ground moraine, outwash plain, end moraine
1330A:			
Peotone silty clay loam, undrained, 0 to 2 percent slopes	Peotone	Yes	ground moraine, end moraine
1529A:			
Selmass loam, undrained, 0 to 2 percent slopes	Selmass	Yes	outwash plain, stream terrace
3107A:			
Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded	Sawmill	Yes	flood plain
4103A:			
Houghton muck, ponded, 0 to 2 percent slopes	Houghton	Yes	ground moraine, lake plain, outwash plain
4777A:			
Adrian muck, ponded, 0 to 2 percent slopes	Adrian	Yes	beach terrace, lake terrace
8082A:			
Millington silt loam, 0 to 2 percent slopes, occasionally flooded	Millington	Yes	flood plain

Table 10.--Forestland Harvest Equipment Considerations

(Only the soils that are commonly used as forestland are listed. See text for a description of the considerations listed in this table)

Map symbol and soil name	Forestland harvest equipment considerations
23A, 23B:	
Blount	Wetness Susceptible to rutting and wheel slippage
103A:	
Houghton	Wetness Susceptible to rutting and wheel slippage
134A, 134B:	
Camden	Susceptible to rutting and wheel slippage
192A, 192B:	
Del Rey	Wetness Susceptible to rutting and wheel slippage
219A:	
Millbrook	Wetness Susceptible to rutting and wheel slippage
228A, 228B, 228B2, 228C2:	
Nappanee	Wetness Susceptible to rutting and wheel slippage
298A, 298B:	
Beecher	Wetness Susceptible to rutting and wheel slippage
320A, 320B, 320B2:	
Frankfort	Wetness Susceptible to rutting and wheel slippage
323B, 323C2, 323D2, 323D3:	
Casco	Susceptible to rutting and wheel slippage
325A, 325B:	
Dresden	Susceptible to rutting and wheel slippage
327A, 327B, 327C2, 327D2:	
Fox	Susceptible to rutting and wheel slippage
365A:	
Aptakisic	Wetness Susceptible to rutting and wheel slippage
370B, 370C2:	
Saylesville	Susceptible to rutting and wheel slippage
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3:	
Ozaukee	Wetness Susceptible to rutting and wheel slippage
530E, 530E2, 530F:	
Ozaukee	Slope Wetness Susceptible to rutting and wheel slippage
531B, 531C2, 531D2:	
Markham	Wetness Susceptible to rutting and wheel slippage

Table 10.--Forestland Harvest Equipment Considerations--Continued

Map symbol and soil name	Forestland harvest equipment considerations
557A:	
Millstream	Wetness Susceptible to rutting and wheel slippage
570B, 570C2:	
Martinsville	Susceptible to rutting and wheel slippage
696A, 696B, 696C2, 696D2:	
Zurich	Susceptible to rutting and wheel slippage
697A, 697B:	
Wauconda	Wetness Susceptible to rutting and wheel slippage
698A, 698B:	
Grays	Susceptible to rutting and wheel slippage
706B, 706C:	
Boyer	Poor traction (loose sandy material)
791A, 791B, 791C2:	
Rush	Susceptible to rutting and wheel slippage
792A, 792B:	
Bowes	Susceptible to rutting and wheel slippage
839B:	
Udipsamments, Typic	Poor traction (loose sandy material)
Udipsamments, Aquic	Wetness Poor traction (loose sandy material)
840B, 840C2:	
Zurich	Susceptible to rutting and wheel slippage
Ozaukee	Wetness Susceptible to rutting and wheel slippage
969E2, 969F:	
Casco	Slope Susceptible to rutting and wheel slippage
Rodman	Slope
978A, 978B:	
Wauconda	Wetness Susceptible to rutting and wheel slippage
Beecher	Wetness Susceptible to rutting and wheel slippage
979A, 979B:	
Grays	Susceptible to rutting and wheel slippage
Markham	Wetness Susceptible to rutting and wheel slippage
981A, 981B:	
Wauconda	Wetness Susceptible to rutting and wheel slippage
Frankfort	Wetness Susceptible to rutting and wheel slippage

Table 10.--Forestland Harvest Equipment Considerations--Continued

Map symbol and soil name	Forestland harvest equipment considerations
982A, 982B:	
Aptakisic	Wetness Susceptible to rutting and wheel slippage
Nappanee	Wetness Susceptible to rutting and wheel slippage
983B:	
Zurich	Susceptible to rutting and wheel slippage
Nappanee	Wetness Susceptible to rutting and wheel slippage
1082A:	
Millington	Wetness Susceptible to rutting and wheel slippage
1103A:	
Houghton	Wetness Susceptible to rutting and wheel slippage
1107A:	
Sawmill	Flooding Wetness Susceptible to rutting and wheel slippage
3107A:	
Sawmill	Flooding Wetness Susceptible to rutting and wheel slippage
8082A:	
Millington	Wetness Susceptible to rutting and wheel slippage

Table 11.--Forest Haul Road and Log Landing Considerations

(Only the soils that are commonly used as forestland are listed. See text for a description of the considerations listed in this table)

Map symbol and soil name	Haul road considerations	Log landing considerations
23A, 23B:		
Blount	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
103A:		
Houghton	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
134A, 134B:		
Camden	Low bearing strength	Susceptible to rutting and wheel slippage
192A, 192B:		
Del Rey	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
219A:		
Millbrook	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
228A, 228B, 228B2, 228C2:		
Nappanee	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
298A, 298B:		
Beecher	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
320A, 320B, 320B2:		
Frankfort	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
323B, 323C2:		
Casco	Low bearing strength	Susceptible to rutting and wheel slippage
323D2, 323D3:		
Casco	Slope Low bearing strength	Slope Susceptible to rutting and wheel slippage
325A, 325B:		
Dresden	Low bearing strength	Susceptible to rutting and wheel slippage
327A, 327B, 327C2:		
Fox	Low bearing strength	Susceptible to rutting and wheel slippage
327D2:		
Fox	Slope Low bearing strength	Slope Susceptible to rutting and wheel slippage
365A:		
Aptakisic	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
370B, 370C2:		
Saylesville	Low bearing strength	Susceptible to rutting and wheel slippage
530B, 530B2, 530C, 530C2, 530C3:		
Ozaukee	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage

Table 11.--Forest Haul Road and Log Landing Considerations--Continued

Map symbol and soil name	Haul road considerations	Log landing considerations
530D, 530D2, 530D3, 530E, 530E2, 530F:		
Ozaukee	Slope Wetness Low bearing strength	Slope Wetness Susceptible to rutting and wheel slippage
531B, 531C2:		
Markham	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
531D2:		
Markham	Slope Wetness Low bearing strength	Slope Wetness Susceptible to rutting and wheel slippage
557A:		
Millstream	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
570B, 570C2:		
Martinsville	Low bearing strength	Susceptible to rutting and wheel slippage
696A, 696B, 696C2:		
Zurich	Low bearing strength	Susceptible to rutting and wheel slippage
696D2:		
Zurich	Slope Low bearing strength	Slope Susceptible to rutting and wheel slippage
697A, 697B:		
Wauconda	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
698A, 698B:		
Grays	Low bearing strength	Susceptible to rutting and wheel slippage
706B, 706C:		
Boyer	No major considerations	No major considerations
791A, 791B, 791C2:		
Rush	Low bearing strength	Susceptible to rutting and wheel slippage
792A, 792B:		
Bowes	Low bearing strength	Susceptible to rutting and wheel slippage
839B:		
Udipsamments, Typic	No major considerations	No major considerations
Udipsamments, Aquic	Wetness	Wetness
840B, 840C2:		
Zurich	Low bearing strength	Susceptible to rutting and wheel slippage
Ozaukee	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
969E2, 969F:		
Casco	Slope Low bearing strength	Slope Susceptible to rutting and wheel slippage
Rodman	Slope	Slope

Table 11.--Forest Haul Road and Log Landing Considerations--Continued

Map symbol and soil name	Haul road considerations	Log landing considerations
978A, 978B:		
Wauconda	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
Beecher	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
979A, 979B:		
Grays	Low bearing strength	Susceptible to rutting and wheel slippage
Markham	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
981A, 981B:		
Wauconda	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
Frankfort	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
982A, 982B:		
Aptakisic	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
Nappanee	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
983B:		
Zurich	Low bearing strength	Susceptible to rutting and wheel slippage
Nappanee	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
1082A:		
Millington	Wetness Low bearing strength	Flooding Wetness Susceptible to rutting and wheel slippage
1103A:		
Houghton	Wetness Low bearing strength	Wetness Susceptible to rutting and wheel slippage
1107A:		
Sawmill	Flooding Wetness Low bearing strength	Flooding Wetness Susceptible to rutting and wheel slippage
3107A:		
Sawmill	Flooding Wetness Low bearing strength	Flooding Wetness Susceptible to rutting and wheel slippage
8082A:		
Millington	Wetness Low bearing strength	Flooding Wetness Susceptible to rutting and wheel slippage

Table 12.--Forestland Site Preparation and Planting Considerations

(Only the soils that are commonly used as forestland are listed. See text for a description of the considerations listed in this table)

Map symbol and soil name	Site preparation and planting considerations
23A, 23B:	
Blount	Wetness Potential poor tilth and compaction
103A:	
Houghton	Wetness
134A, 134B:	
Camden	Potential poor tilth and compaction
192A, 192B:	
Del Rey	Wetness Potential poor tilth and compaction
219A:	
Millbrook	Wetness Potential poor tilth and compaction
228A, 228B, 228B2, 228C2:	
Nappanee	Wetness Potential poor tilth and compaction
298A, 298B:	
Beecher	Wetness Potential poor tilth and compaction
320A, 320B, 320B2:	
Frankfort	Wetness Potential poor tilth and compaction
323B, 323C2:	
Casco	No major considerations
323D2:	
Casco	Water erosion
323D3:	
Casco	Water erosion Potential poor tilth and compaction
325A, 325B:	
Dresden	Potential poor tilth and compaction
327A, 327B, 327C2:	
Fox	Potential poor tilth and compaction
327D2:	
Fox	Water erosion Potential poor tilth and compaction
365A:	
Aptakisic	Wetness Potential poor tilth and compaction
370B, 370C2:	
Saylesville	Potential poor tilth and compaction

Table 12.--Forestland Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
530B, 530B2, 530C, 530C2, 530C3:	
Ozaukee	Wetness Potential poor tilth and compaction
530D, 530D2, 530D3:	
Ozaukee	Wetness Water erosion Potential poor tilth and compaction
530E, 530E2, 530F:	
Ozaukee	Slope Wetness Water erosion Potential poor tilth and compaction
531B, 531C2:	
Markham	Wetness Potential poor tilth and compaction
531D2:	
Markham	Wetness Water erosion Potential poor tilth and compaction
557A:	
Millstream	Wetness Potential poor tilth and compaction
570B, 570C2:	
Martinsville	No major considerations
696A, 696B, 696C2:	
Zurich	Potential poor tilth and compaction
696D2:	
Zurich	Water erosion Potential poor tilth and compaction
697A, 697B:	
Wauconda	Wetness Potential poor tilth and compaction
698A, 698B:	
Grays	Potential poor tilth and compaction
706B, 706C:	
Boyer	No major considerations
791A, 791B, 791C2:	
Rush	Potential poor tilth and compaction
792A, 792B:	
Bowes	Potential poor tilth and compaction
839B:	
Udipsamments, Typic	No major considerations
Udipsamments, Aquic	Wetness

Table 12.--Forestland Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
840B, 840C2:	
Zurich	Potential poor tilth and compaction
Ozaukee	Wetness Potential poor tilth and compaction
969E2, 969F:	
Casco	Slope Water erosion
Rodman	Slope Water erosion
978A, 978B:	
Wauconda	Wetness Potential poor tilth and compaction
Beecher	Wetness Potential poor tilth and compaction
979A, 979B:	
Grays	Potential poor tilth and compaction
Markham	Wetness Potential poor tilth and compaction
981A, 981B:	
Wauconda	Wetness Potential poor tilth and compaction
Frankfort	Wetness Potential poor tilth and compaction
982A, 982B:	
Aptakisic	Wetness Potential poor tilth and compaction
Nappanee	Wetness Potential poor tilth and compaction
983B:	
Zurich	Potential poor tilth and compaction
Nappanee	Wetness Potential poor tilth and compaction
1082A:	
Millington	Wetness
1103A:	
Houghton	Wetness
1107A:	
Sawmill	Flooding Wetness
3107A:	
Sawmill	Flooding Wetness

Table 12.--Forestland Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
8082A:	
Millington-------------------	Wetness

Table 13.--Forestland Productivity

(Only the soils that are commonly used as forestland are listed. See text for definitions of terms used in this table)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
23A, 23B:				
Blount	Northern red oak	57	43	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White ash	57	43	
	White oak	57	43	
	Sugar maple	54	29	
103A:				
Houghton	Silver maple	82	29	Eastern cottonwood, green ash, pin oak, swamp white oak
	Quaking aspen	60	57	
	White ash	56	43	
	Red maple	56	29	
	Arborvitae	37	57	
	Green ash	---	---	
134A, 134B:				
Camden	Northern red oak	85	72	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	85	72	
	Green ash	76	72	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
192A, 192B:				
Del Rey	Northern red oak	56	43	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White ash	56	43	
	White oak	56	43	
	American basswood	56	43	
	Bur oak	---	---	
219A:				
Millbrook	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
228A, 228B, 228B2, 228C2:				
Nappanee	Pin oak	85	72	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White oak	75	72	
	American sycamore	---	---	
	Northern red oak	---	---	
	Shagbark hickory	---	---	
298A, 298B:				
Beecher	Northern red oak	65	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	Black cherry	---	---	
	Bur oak	---	---	
	Northern pin oak	---	---	
	Shagbark hickory	---	---	
	White oak	---	---	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
320A, 320B, 320B2:				
Frankfort	Northern red oak	70	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White oak	70	57	
	Bur oak	---	---	
	Green ash	---	---	
323B, 323C2, 323D2, 323D3:				
Casco	Northern red oak	55	43	Black oak, common hackberry, eastern white pine, green ash
	Black oak	---	---	
	Shagbark hickory	---	---	
325A, 325B:				
Dresden	Northern red oak	70	57	Black oak, common hackberry, eastern white pine, green ash
	American basswood	---	---	
	Black cherry	---	---	
	Black oak	---	---	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
327A, 327B, 327C2, 327D2:				
Fox	Northern red oak	65	57	Black oak, common hackberry, eastern white pine, green ash
	Black cherry	---	---	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
365A:				
Aptakisic	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
370B, 370C2:				
Saylesville	Northern red oak	75	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	Sugar maple	---	---	
	White ash	---	---	
	White oak	---	---	
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3, 530E, 530E2, 530F:				
Ozaukee	Northern red oak	66	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	American basswood	---	---	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
	White ash	---	---	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
531B, 531C2, 531D2:				
Markham	Northern red oak	65	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	Black cherry	---	---	
	Shagbark hickory	---	---	
	White oak	---	---	
557A:				
Millstream	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	Black walnut	---	---	
	Shagbark hickory	---	---	
	White oak	---	---	
570B, 570C2:				
Martinsville	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
696A, 696B, 696C2, 696D2:				
Zurich	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Sugar maple	66	43	
	American basswood	---	---	
	White ash	---	---	
697A, 697B:				
Wauconda	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
698A, 698B:				
Grays	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
706B, 706C:				
Boyer	Northern red oak	75	57	Black oak, common hackberry, eastern white pine, green ash
	White oak	70	57	
	Jack pine	68	100	
	Eastern white pine	65	143	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
791A, 791B, 791C2:				
Rush	Northern red oak	90	72	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	90	72	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
792A, 792B:				
Bowes	Northern red oak	90	72	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	90	72	
	Shagbark hickory	---	---	
	White ash	---	---	
839B:				
Udipsamments, Typic	Eastern white pine	65	143	Common hackberry, eastern redcedar, eastern white pine, green ash, red maple
	Northern red oak	55	43	
	Black oak	50	29	
Udipsamments, Aquic	Pin oak	85	72	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	Northern red oak	70	57	
	Eastern white pine	65	143	
840B, 840C2:				
Zurich	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Sugar maple	66	43	
	American basswood	---	---	
	White ash	---	---	
Ozaukee	Northern red oak	66	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	American basswood	---	---	
	Shagbark hickory	---	---	
	Sugar maple	---	---	
	White ash	---	---	
969E2, 969F:				
Casco	Northern red oak	55	43	Black oak, common hackberry, eastern white pine, green ash
	Black oak	---	---	
	Shagbark hickory	---	---	
Rodman	Northern red oak	45	29	Bur oak, chinkapin oak, eastern redcedar, green ash, thornless honeylocust
	Shagbark hickory	---	---	
	White oak	---	---	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
978A, 978B:				
Wauconda	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
Beecher	Northern red oak	65	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	Black cherry	---	---	
	Bur oak	---	---	
	Northern pin oak	---	---	
	Shagbark hickory	---	---	
	White oak	---	---	
979A, 979B:				
Grays	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
Markham	Northern red oak	65	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	Black cherry	---	---	
	Shagbark hickory	---	---	
	White oak	---	---	
981A, 981B:				
Wauconda	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
	Shagbark hickory	---	---	
Frankfort	Northern red oak	70	57	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White oak	70	57	
	Bur oak	---	---	
	Green ash	---	---	
982A, 982B:				
Aptakisic	Northern red oak	80	57	Common hackberry, eastern cottonwood, green ash, pecan, pin oak, swamp white oak
	White oak	80	57	
	Black walnut	---	---	
Nappanee	Pin oak	85	72	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White oak	75	72	
	American sycamore	---	---	
	Northern red oak	---	---	
	Shagbark hickory	---	---	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
983B:				
Zurich	Northern red oak	80	57	Black walnut, eastern cottonwood, eastern white pine, green ash, northern red oak, pecan, pin oak, white oak
	White oak	80	57	
	Sugar maple	66	43	
	American basswood	---	---	
	White ash	---	---	
Nappanee	Pin oak	85	72	Black oak, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash
	White oak	75	72	
	American sycamore	---	---	
	Northern red oak	---	---	
	Shagbark hickory	---	---	
1082A:				
Millington	American beech	---	---	Bur oak, common hackberry, eastern cottonwood, eastern redcedar, green ash
	American sycamore	---	---	
	Blackgum	---	---	
	Northern red oak	---	---	
	Pin oak	---	---	
	Red maple	---	---	
	Shagbark hickory	---	---	
	Swamp white oak	---	---	
	White ash	---	---	
1103A:				
Houghton	Silver maple	82	29	Eastern cottonwood, green ash, pin oak, swamp white oak
	Quaking aspen	60	57	
	White ash	56	43	
	Red maple	56	29	
	Arborvitae	37	57	
	Green ash	---	---	
1107A:				
Sawmill	Pin oak	90	72	Common hackberry, eastern cottonwood, green ash, pin oak, river birch, swamp white oak
	American sycamore	---	---	
	Eastern cottonwood	---	---	
3107A:				
Sawmill	Pin oak	90	72	Common hackberry, eastern cottonwood, green ash, pin oak, river birch, swamp white oak
	American sycamore	---	---	
	Eastern cottonwood	---	---	

Table 13.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
8082A:				
Millington	American beech	---	---	Bur oak, common hackberry, eastern cottonwood, eastern redcedar, green ash
	American sycamore	---	---	
	Blackgum	---	---	
	Northern red oak	---	---	
	Pin oak	---	---	
	Red maple	---	---	
	Shagbark hickory	---	---	
	Swamp white oak	---	---	
	White ash	---	---	

Table 14.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
23A, 23B: Blount	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
67A: Harpster	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
103A: Houghton	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Common serviceberry, hazel alder, nannyberry, roughleaf dogwood	Arborvitae	Green ash, pin oak, river birch, swamp white oak	Carolina poplar, eastern cottonwood
134A, 134B: Camden	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
146A, 146B:					
Elliott	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
153A, 153A+:					
Pella	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
189A, 189B:					
Martinton	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
192A, 192B:					
Del Rey	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
219A:					
Millbrook	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
223B, 223C2:					
Varna	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
228A, 228B, 228B2, 228C2:					
Nappanee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
232A:					
Ashkum	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
298A, 298B:					
Beecher	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
318C2:					
Lorenzo	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
320A, 320B, 320B2: Frankfort	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
323B, 323C2, 323D2, 323D3: Casco	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---
325A, 325B: Dresden	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
327A, 327B, 327C2, 327D2: Fox	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---
330A: Peotone	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
365A: Aptakisic	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
367. Beach sand					

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
370B, 370C2: Saylesville	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
442A, 442B: Mundelein	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
443A, 443B: Barrington	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
465A:					
Montgomery	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
488A:					
Hooppole	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
513A:					
Granby	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
523A:					
Dunham	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
526A:					
Grundelein	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3, 530E, 530E2, 530F:					
Ozaukee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
531B, 531C2, 531D2:					
Markham	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
557A:					
Millstream	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
570B, 570C2:					
Martinsville	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
626A:					
Kish	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
696A, 696B, 696C2, 696D2:					
Zurich	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
697A, 697B:					
Wauconda	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
698A, 698B:					
Grays	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
706B, 706C:					
Boyer	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---
791A, 791B, 791C2:					
Rush	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
792A, 792B:					
Bowes	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
802B:					
Orthents, loamy	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
805B:					
Orthents, clayey	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
830:					
Landfills	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, common persimmon, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak, tuliptree	Carolina poplar, eastern cottonwood, eastern white pine
839B:					
Udipsamments, Typic	American hazelnut, common elderberry, common winterberry, coralberry, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, alternateleaf dogwood, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, southern arrowwood, staghorn sumac	Washington hawthorn, blue spruce, common hackberry, eastern redcedar, green ash, red maple	Carolina poplar	Eastern white pine
Udipsamments, Aquic	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
840B, 840C2:					
Zurich	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
Ozaukee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
865.					
Pits, gravel					
969E2, 969F:					
Casco	American cranberrybush, American hazelnut, black chokeberry, common chokecherry, common elderberry, common juniper, coralberry, mapleleaf viburnum, silky dogwood	American plum, bur oak, chinkapin oak, common serviceberry, eastern redcedar, nannyberry, prairie crabapple, roughleaf dogwood, smooth sumac	Black oak, common hackberry, eastern white pine, green ash	Carolina poplar	---
Rodman	American plum, black chokeberry, blackhaw, common juniper, gray dogwood, mapleleaf viburnum	Cockspur hawthorn, common serviceberry, eastern redcedar, nannyberry, prairie crabapple	Bur oak, chinkapin oak, green ash, thornless honeylocust	---	---

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
978A, 978B:					
Wauconda	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
Beecher	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
979A, 979B:					
Grays	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
979A, 979B:					
Markham	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
981A, 981B:					
Wauconda	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
Frankfort	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
982A, 982B:					
Aptakisic	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
Nappanee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
983B:					
Zurich	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
983B:					
Nappanee	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
984B:					
Barrington	American hazelnut, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, coralberry, mapleleaf viburnum, redosier dogwood, silky dogwood	American plum, American witchhazel, blackhaw, common chokecherry, common serviceberry, prairie crabapple, roughleaf dogwood, smooth sumac, southern arrowwood	Washington hawthorn, arborvitae, blue spruce, eastern redcedar, nannyberry, pecan, white oak	Douglas fir, Norway spruce, black walnut, blackgum, common hackberry, green ash, northern red oak, pin oak	Carolina poplar, eastern cottonwood, eastern white pine
Varna	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
989A, 989B:					
Mundelein	American cranberrybush, Canada yew, black chokeberry, common elderberry, common juniper, common ninebark, common winterberry, northern spicebush, redosier dogwood, silky dogwood	Blackhaw, cockspur hawthorn, common pawpaw, common serviceberry, prairie crabapple, roughleaf dogwood, rusty blackhaw, southern arrowwood, witchhazel	Austrian pine, Douglas fir, arborvitae, blue spruce, eastern redcedar, green hawthorn, nannyberry, pecan, shingle oak	Norway spruce, blackgum, common hackberry, green ash, red maple, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
Elliott	American cranberrybush, American hazelnut, black chokeberry, common juniper, coralberry, gray dogwood, mapleleaf viburnum, silky dogwood	American plum, American witchhazel, Washington hawthorn, blackhaw, common chokecherry, common serviceberry, nannyberry, prairie crabapple, roughleaf dogwood, staghorn sumac	Arborvitae, black oak, blackgum, bur oak, chinkapin oak, common hackberry, eastern redcedar, green ash	Norway spruce	Carolina poplar
1082A:					
Millington	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---
1103A:					
Houghton	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Common serviceberry, hazel alder, nannyberry, roughleaf dogwood	Arborvitae	Green ash, pin oak, river birch, swamp white oak	Carolina poplar, eastern cottonwood

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
1107A:					
Sawmill	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
1210A:					
Lena	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Common serviceberry, hazel alder, nannyberry, roughleaf dogwood	Arborvitae	Green ash, pin oak, river birch, swamp white oak	Carolina poplar, eastern cottonwood
1330A:					
Peotone	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak

Table 14.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1529A:					
Selmass	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
3107A:					
Sawmill	American cranberrybush, black chokeberry, buttonbush, common elderberry, common ninebark, common winterberry, gray dogwood, highbush blueberry, northern spicebush, redosier dogwood, silky dogwood	Cockspur hawthorn, hazel alder, nannyberry, roughleaf dogwood	Arborvitae, blackgum, common hackberry, green hawthorn, shingle oak	Green ash, red maple, river birch, swamp white oak	Carolina poplar, eastern cottonwood, pin oak
4103A. Houghton					
4777A. Adrian					
8082A:					
Millington	Common winterberry, gray dogwood, redosier dogwood	Common pawpaw, nannyberry, roughleaf dogwood, silky dogwood	Arborvitae, bur oak, common hackberry, eastern redcedar, green hawthorn	Carolina poplar, eastern cottonwood, green ash	---

Table 15a.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
23B:						
Blount	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
67A:						
Harpster	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
134A:						
Camden	Not limited		Not limited		Not limited	
134B:						
Camden	Not limited		Not limited		Somewhat limited	
					Slope	0.28
146A:						
Elliott	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.88	Restricted permeability	0.96
146B:						
Elliott	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.88	Restricted permeability	0.96
					Slope	0.12
153A, 153A+:						
Pella	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
189A:						
Martinton-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
189B:						
Martinton-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.12
192A:						
Del Rey-------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.94	Restricted permeability	0.96
192B:						
Del Rey-------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.94	Restricted permeability	0.96
					Slope	0.12
219A:						
Millbrook-----------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
223B:						
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
223C2:						
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.88
228A:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
228B, 228B2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.12

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
228C2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.88
232A:						
Ashkum--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
298A:						
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
298B:						
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
318C2:						
Lorenzo-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
320A:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
320B, 320B2:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.12
323B:						
Casco---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
323C2:						
Casco---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
323D2, 323D3:						
Casco---------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
325A:						
Dresden	Not limited		Not limited		Not limited	
325B:						
Dresden	Not limited		Not limited		Somewhat limited	
					Slope	0.12
327A:						
Fox	Not limited		Not limited		Not limited	
327B:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.12
327C2:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.88
327D2:						
Fox	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
365A:						
Aptakisic	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
367:						
Beach sand	Not rated		Not rated		Not rated	
370B:						
Saylesville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
					Slope	0.12
370C2:						
Saylesville	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.88
					Restricted permeability	0.21
442A:						
Mundelein	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
442B:						
Mundelein	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
					Slope	0.12

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
443A:						
Barrington----------	Not limited		Not limited		Not limited	
443B:						
Barrington----------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
465A:						
Montgomery----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
488A:						
Hooppole------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
513A:						
Granby--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
523A:						
Dunham--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
526A:						
Grundelein----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
530B, 530B2:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
530C, 530C2, 530C3:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.16	Depth to saturated zone	0.08	Slope	0.88
					Depth to saturated zone	0.16
530D, 530D2, 530D3:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Depth to saturated zone	0.16	Depth to saturated zone	0.08	Restricted permeability	0.96
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.16

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
530E, 530E2, 530F:						
Ozaukee	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.16	Depth to saturated zone	0.08	Depth to saturated zone	0.16
531B:						
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
531C2:						
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.07	Depth to saturated zone	0.03	Slope	0.88
					Depth to saturated zone	0.07
531D2:						
Markham	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.04	Slope	0.04	Restricted permeability	0.96
	Depth to saturated zone	0.03	Depth to saturated zone	0.02	Depth to saturated zone	0.03
557A:						
Millstream	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
570B:						
Martinsville	Not limited		Not limited		Somewhat limited	
					Slope	0.12
570C2:						
Martinsville	Not limited		Not limited		Somewhat limited	
					Slope	0.88
626A:						
Kish	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
696A:						
Zurich	Not limited		Not limited		Not limited	
696B:						
Zurich	Not limited		Not limited		Somewhat limited	
					Slope	0.12
696C2:						
Zurich	Not limited		Not limited		Somewhat limited	
					Slope	0.88

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
696D2:						
Zurich--------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
697A:						
Wauconda------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
697B:						
Wauconda------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
					Slope	0.12
698A:						
Grays---------------	Not limited		Not limited		Not limited	
698B:						
Grays---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
706B:						
Boyer---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
					Gravel content	0.01
706C:						
Boyer---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
					Gravel content	0.01
791A:						
Rush----------------	Not limited		Not limited		Not limited	
791B:						
Rush----------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
791C2:						
Rush----------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
792A:						
Bowes---------------	Not limited		Not limited		Not limited	
792B:						
Bowes---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
802B:						
Orthents, loamy-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.28
					Restricted permeability	0.21
805B:						
Orthents, clayey----	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
					Slope	0.12

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
					Slope	0.28
Udipsamments, Aquic	Very limited		Very limited		Very limited	
	Too sandy	1.00	Too sandy	1.00	Too sandy	1.00
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
840B:						
Zurich--------------	Not limited		Not limited		Somewhat limited	
					Slope	0.12
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
840C2:						
Zurich--------------	Not limited		Not limited		Somewhat limited	
					Slope	0.88
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.16	Depth to saturated zone	0.08	Slope	0.88
					Depth to saturated zone	0.16
865:						
Pits, gravel--------	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.02	Gravel content	0.02	Gravel content	1.00
978A:						
Wauconda------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.99	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
978B:						
Wauconda------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
					Slope	0.12

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
978B:						
Beecher	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
979A:						
Grays	Not limited		Not limited		Not limited	
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
979B:						
Grays	Not limited		Not limited		Somewhat limited	
					Slope	0.12
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
981A:						
Wauconda	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
Frankfort	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
981B:						
Wauconda	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
					Slope	0.12
Frankfort	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.12
982A:						
Aptakisic	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
982B:						
Aptakisic	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.94	Depth to saturated zone	1.00
					Slope	0.12
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.12
983B:						
Zurich	Not limited		Not limited		Somewhat limited	
					Slope	0.12
Nappanee	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Depth to saturated zone	0.94	Restricted permeability	1.00
					Slope	0.12
984B:						
Barrington	Not limited		Not limited		Somewhat limited	
					Slope	0.12
Varna	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.12
989A:						
Mundelein	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
Elliott	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.88	Restricted permeability	0.96
989B:						
Mundelein	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.75	Depth to saturated zone	0.98
					Slope	0.12
Elliott	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.88	Restricted permeability	0.96
					Slope	0.12

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
1082A:						
Millington	Very limited Depth to saturated zone Flooding Ponding	 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	 1.00 1.00 0.60
1103A:						
Houghton	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Ponding Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00
1107A:						
Sawmill	Very limited Depth to saturated zone Flooding Ponding	 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	 1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Ponding	 1.00 1.00 1.00
1210A:						
Lena	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Ponding Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone Content of organic matter	 1.00 1.00
1330A:						
Peotone	Very limited Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 0.21	Very limited Ponding Depth to saturated zone Restricted permeability	 1.00 1.00 0.21	Very limited Depth to saturated zone Ponding Restricted permeability	 1.00 1.00 0.21
1529A:						
Selmass	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00
3107A:						
Sawmill	Very limited Depth to saturated zone Flooding Ponding	 1.00 1.00 1.00	Very limited Depth to saturated zone Ponding Flooding	 1.00 1.00 0.40	Very limited Depth to saturated zone Flooding Ponding	 1.00 1.00 1.00
4103A:						
Houghton	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Ponding Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone Ponding	 1.00 1.00
4777A:						
Adrian	Very limited Depth to saturated zone Ponding	 1.00 1.00	Very limited Ponding Depth to saturated zone	 1.00 1.00	Very limited Depth to saturated zone Content of organic matter	 1.00 1.00

Table 15a.--Recreational Development--Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8082A:						
Millington----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Flooding	0.60

Table 15b.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.99
67A:						
Harpster	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Content of organic matter	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
134A, 134B:						
Camden	Not limited		Not limited		Not limited	
146A, 146B:						
Elliott	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.73	Depth to saturated zone	0.73	Depth to saturated zone	0.88
153A, 153A+:						
Pella	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
189A, 189B:						
Martinton	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
192A, 192B:						
Del Rey	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
219A:						
Millbrook	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
223B, 223C2:						
Varna	Not limited		Not limited		Not limited	
228A, 228B, 228B2, 228C2:						
Nappanee	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
232A:						
Ashkum	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
298A, 298B:						
Beecher	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.99
318C2:						
Lorenzo	Not limited		Not limited		Somewhat limited	
					Droughty	0.14
320A, 320B, 320B2:						
Frankfort	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
323B, 323C2:						
Casco	Not limited		Not limited		Somewhat limited	
					Droughty	0.01
323D2:						
Casco	Not limited		Not limited		Somewhat limited	
					Droughty	0.18
					Slope	0.04
323D3:						
Casco	Not limited		Not limited		Somewhat limited	
					Droughty	0.76
					Slope	0.04
325A, 325B:						
Dresden	Not limited		Not limited		Not limited	
327A, 327B, 327C2:						
Fox	Not limited		Not limited		Not limited	
327D2:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.04
330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
365A:						
Aptakisic	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
367:						
Beach sand	Not rated		Not rated		Not rated	
370B, 370C2:						
Saylesville	Not limited		Not limited		Not limited	

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
442A, 442B:						
Mundelein-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
443A, 443B:						
Barrington----------	Not limited		Not limited		Not limited	
465A:						
Montgomery----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
488A:						
Hooppole------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
513A:						
Granby--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Droughty	0.01
523A:						
Dunham--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
526A:						
Grundelein----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
530B, 530B2, 530C, 530C2, 530C3:						
Ozaukee------------	Not limited		Not limited		Not limited	
530D, 530D2, 530D3:						
Ozaukee-------------	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.08
					Slope	0.04
530E, 530E2:						
Ozaukee-------------	Somewhat limited		Not limited		Very limited	
	Slope	0.02			Slope	1.00
					Depth to saturated zone	0.08
530F:						
Ozaukee-------------	Very limited		Not limited		Very limited	
	Slope	1.00			Slope	1.00
531B, 531C2:						
Markham-------------	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
531D2:						
Markham-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.04
					Depth to saturated zone	0.02
557A:						
Millstream----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
570B, 570C2:						
Martinsville--------	Not limited		Not limited		Not limited	
626A:						
Kish----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
696A, 696B, 696C2:						
Zurich--------------	Not limited		Not limited		Not limited	
696D2:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
697A, 697B:						
Wauconda------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
698A, 698B:						
Grays---------------	Not limited		Not limited		Not limited	
706B, 706C:						
Boyer---------------	Not limited		Not limited		Not limited	
791A, 791B, 791C2:						
Rush----------------	Not limited		Not limited		Not limited	
792A, 792B:						
Bowes---------------	Not limited		Not limited		Not limited	
802B:						
Orthents, loamy-----	Not limited		Not limited		Not limited	
805B:						
Orthents, clayey----	Very limited		Very limited		Very limited	
	Too clayey	1.00	Too clayey	1.00	Too clayey	1.00
					Droughty	0.48
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.99
					Too sandy	0.50

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
839B:						
Udipsamments, Aquic	Very limited		Very limited		Somewhat limited	
	Too sandy	1.00	Too sandy	1.00	Droughty	0.96
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Too sandy	0.50
840B, 840C2:						
Zurich	Not limited		Not limited		Not limited	
Ozaukee	Not limited		Not limited		Not limited	
865:						
Pits, gravel	Not rated		Not rated		Not rated	
969E2:						
Casco	Somewhat limited		Not limited		Very limited	
	Slope	0.02			Slope	1.00
					Droughty	0.05
Rodman	Somewhat limited		Not limited		Very limited	
	Slope	0.02			Slope	1.00
					Droughty	1.00
					Gravel content	0.02
969F:						
Casco	Very limited		Not limited		Very limited	
	Slope	1.00			Slope	1.00
					Droughty	0.34
Rodman	Very limited		Not limited		Very limited	
	Slope	1.00			Slope	1.00
					Droughty	0.94
					Gravel content	0.02
978A, 978B:						
Wauconda	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
Beecher	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.99
979A, 979B:						
Grays	Not limited		Not limited		Not limited	
Markham	Not limited		Not limited		Not limited	
981A, 981B:						
Wauconda	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
Frankfort	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
982A, 982B:						
Aptakisic-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
Nappanee------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
983B:						
Zurich--------------	Not limited		Not limited		Not limited	
Nappanee------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.94
984B:						
Barrington----------	Not limited		Not limited		Not limited	
Varna---------------	Not limited		Not limited		Not limited	
989A, 989B:						
Mundelein-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
Elliott-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.73	Depth to saturated zone	0.73	Depth to saturated zone	0.88
1082A:						
Millington----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Flooding	0.60
1103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
1107A:						
Sawmill-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Ponding	1.00
1210A:						
Lena----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00

Table 15b.--Recreational Development--Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
1330A:						
Peotone-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
1529A:						
Selmass-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
3107A:						
Sawmill-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Ponding	1.00
4103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
4777A:						
Adrian--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
8082A:						
Millington----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Flooding	0.60

Table 16.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
23A:										
Blount	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
23B:										
Blount	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
67A:										
Harpster	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
103A:										
Houghton	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
134A, 134B:										
Camden	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
146A:										
Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
146B:										
Elliott	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
153A, 153A+:										
Pella	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
189A:										
Martinton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
189B:										
Martinton	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
192A:										
Del Rey	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
192B:										
Del Rey	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
219A:										
Millbrook	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
223B:										
Varna	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
223C2:										
Varna	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
228A:										
Nappanee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
228B, 228B2:										
Nappanee	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
228C2:										
Nappanee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 16.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
232A: Ashkum	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
298A: Beecher	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
298B: Beecher	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
318C2: Lorenzo	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
320A: Frankfort	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
320B, 320B2: Frankfort	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
323B, 323C2, 323D2, 323D3: Casco	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
325A, 325B: Dresden	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
327A, 327B: Fox	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
327C2: Fox	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
327D2: Fox	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
330A: Peotone	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
365A: Aptakisic	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
367. Beach sand										
370B: Saylesville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
370C2: Saylesville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
442A: Mundelein	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

Table 16.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
442B:										
Mundelein----------	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
443A, 443B:										
Barrington--------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
465A:										
Montgomery--------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
488A:										
Hooppole----------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
513A:										
Granby------------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
523A:										
Dunham------------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
526A:										
Grundelein--------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
530B, 530B2:										
Ozaukee-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
530C, 530C2, 530C3:										
Ozaukee-----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
530D, 530D2, 530D3:										
Ozaukee-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
530E, 530E2, 530F:										
Ozaukee-----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
531B:										
Markham-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
531C2:										
Markham-----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
531D2:										
Markham-----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
557A:										
Millstream--------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
570B:										
Martinsville------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
570C2:										
Martinsville------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
626A:										
Kish--------------	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 16.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
696A, 696B:										
Zurich	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
696C2:										
Zurich	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
696D2:										
Zurich	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
697A:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
697B:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
698A, 698B:										
Grays	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
706B:										
Boyer	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
706C:										
Boyer	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
791A, 791B:										
Rush	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
791C2:										
Rush	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
792A, 792B:										
Bowes	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
802B:										
Orthents, loamy	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
805B:										
Orthents, clayey	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
830.										
Landfills										
839B:										
Udipsamments, Typic	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Udipsamments, Aquic	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.

Table 16.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
840B:										
Zurich	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ozaukee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
840C2:										
Zurich	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ozaukee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
865. Pits, gravel										
969E2, 969F:										
Casco	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Rodman	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
978A:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Beecher	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
978B:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Beecher	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
979A, 979B:										
Grays	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Markham	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
981A:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Frankfort	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
981B:										
Wauconda	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Frankfort	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
982A:										
Aptakisic	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Nappanee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
982B:										
Aptakisic	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Nappanee	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
983B:										
Zurich	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Nappanee	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.

Table 16.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
984B:										
Barrington	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Varna	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
989A:										
Mundelein	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Elliott	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
989B:										
Mundelein	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Elliott	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
1082A:										
Millington	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1103A:										
Houghton	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
1107A:										
Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1210A:										
Lena	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
1330A:										
Peotone	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
1529A:										
Selmass	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3107A:										
Sawmill	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
4103A:										
Houghton	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
4777A:										
Adrian	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
8082A:										
Millington	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 17a.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
67A:						
Harpster------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
134A, 134B:						
Camden--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
146A, 146B:						
Elliott-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
153A, 153A+:						
Pella---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
189A, 189B:						
Martinton-----------	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
192A, 192B:						
Del Rey-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
219A:						
Millbrook-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
223B:						
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
223C2:						
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	0.68
					Shrink-swell	0.50
			Shrink-swell	0.50		
228A, 228B, 228B2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
228C2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.68
					Shrink-swell	0.50
232A:						
Ashkum--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Ponding	1.00	Shrink-swell	1.00
	Ponding	1.00	Shrink-swell	0.50	Ponding	1.00
298A, 298B:						
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
318C2:						
Lorenzo-------------	Not limited		Not limited		Somewhat limited	
					Slope	0.68
320A, 320B, 320B2:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
323B:						
Casco---------------	Not limited		Not limited		Not limited	
323C2:						
Casco---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.68

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
323D2, 323D3:						
Casco	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
325A, 325B:						
Dresden	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
327A, 327B:						
Fox	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
327C2:						
Fox	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Slope	0.68
					Shrink-swell	0.50
327D2:						
Fox	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Slope	0.04	Slope	1.00
	Slope	0.04			Shrink-swell	0.50
330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
365A:						
Aptakisic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
367:						
Beach sand	Not rated		Not rated		Not rated	
370B:						
Saylesville	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
370C2:						
Saylesville	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	0.68
			Shrink-swell	0.50	Shrink-swell	0.50
442A, 442B:						
Mundelein	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Shrink-swell	0.50			Shrink-swell	0.50
443A, 443B:						
Barrington	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
465A:						
Montgomery----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
488A:						
Hooppole-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
513A:						
Granby-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
523A:						
Dunham-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
526A:						
Grundelein----------	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
530B, 530B2:						
Ozaukee------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
530C, 530C2, 530C3:						
Ozaukee------------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	0.68
	Depth to saturated zone	0.20	Shrink-swell	0.50	Shrink-swell	0.50
					Depth to saturated zone	0.20
530D, 530D2, 530D3:						
Ozaukee------------	Somewhat limited		Very limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.20	Shrink-swell	0.50	Shrink-swell	0.50
	Slope	0.04	Slope	0.04	Depth to saturated zone	0.20
530E, 530E2, 530F:						
Ozaukee------------	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.20	Slope	1.00	Depth to saturated zone	0.20

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
531B:						
Markham	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
531C2:						
Markham	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	0.68
	Depth to saturated zone	0.10			Shrink-swell	0.50
					Depth to saturated zone	0.10
531D2:						
Markham	Somewhat limited		Very limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.05	Slope	0.04	Shrink-swell	0.50
	Slope	0.04			Depth to saturated zone	0.05
557A:						
Millstream	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
570B:						
Martinsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
570C2:						
Martinsville	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Slope	0.68
					Shrink-swell	0.50
626A:						
Kish	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
696A, 696B:						
Zurich	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
696C2:						
Zurich	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	0.68
					Shrink-swell	0.50
696D2:						
Zurich	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.50

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
697A, 697B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
698A, 698B:						
Grays---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
706B:						
Boyer---------------	Not limited		Not limited		Not limited	
706C:						
Boyer---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.68
791A, 791B:						
Rush----------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
791C2:						
Rush----------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.68
					Shrink-swell	0.50
792A, 792B:						
Bowes---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
802B:						
Orthents, loamy-----	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to saturated zone	0.47		
805B:						
Orthents, clayey----	Very limited		Very limited		Very limited	
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
			Depth to saturated zone	0.99		
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Not limited		Not limited		Not limited	
Udipsamments, Aquic	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
840B:						
Zurich--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
840B:						
Ozaukee	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
840C2:						
Zurich	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Slope	0.68
					Shrink-swell	0.50
Ozaukee	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.20	Depth to saturated zone	1.00	Slope	0.68
					Depth to saturated zone	0.20
865:						
Pits, gravel	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
978A, 978B:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Beecher	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
979A, 979B:						
Grays	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
Markham	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
981A, 981B:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Frankfort	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
982A, 982B:						
Aptakisic-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
983B:						
Zurich--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
984B:						
Barrington----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		
989A, 989B:						
Mundelein-----------	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.99	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Shrink-swell	0.50			Shrink-swell	0.50
Elliott-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
1082A:						
Millington----------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
1103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
1107A:						
Sawmill	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
1210A:						
Lena	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
1330A:						
Peotone	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
1529A:						
Selmass	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
3107A:						
Sawmill	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
4103A:						
Houghton	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Content of organic matter	1.00	Content of organic matter	1.00
4777A:						
Adrian	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Subsidence	1.00	Subsidence	1.00	Subsidence	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 17a.--Building Site Development--Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8082A:						
Millington----------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
			Shrink-swell	0.50		

Table 17b.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. "Not rated" indicates that data are not available or that no rating is applicable. See text for further explanation of ratings in this table)

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount--------------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Low strength	1.00	Too clayey	0.50		
	Depth to saturated zone	0.99				
	Shrink-swell	0.50				
67A:						
Harpster------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				
103A:						
Houghton------------	Very limited		Very limited		Not rated	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Subsidence	1.00	Content of organic matter	1.00		
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00				
134A:						
Camden--------------	Very limited		Not limited		Not limited	
	Low strength	1.00				
	Frost action	1.00				
	Shrink-swell	0.50				
134B:						
Camden--------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00				
	Shrink-swell	0.50				
146A, 146B:						
Elliott-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.88
	Depth to saturated zone	0.88				
	Shrink-swell	0.50				
	Frost action	0.50				
153A, 153A+:						
Pella---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
189A, 189B:						
Martinton----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Depth to saturated zone	0.75	Too clayey	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
192A, 192B:						
Del Rey------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
219A:						
Millbrook----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
223B:						
Varna--------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
223C2:						
Varna--------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Frost action	0.50				
228A, 228B, 228B2:						
Nappanee-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
228C2:						
Nappanee-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50	Droughty	0.01
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
232A:						
Ashkum-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
298A:						
Beecher-------------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Low strength	1.00				
	Depth to saturated zone	0.99				
	Shrink-swell	0.50				
298B:						
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00				
	Frost action	1.00				
	Shrink-swell	0.50				
318C2:						
Lorenzo-------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.14
320A, 320B, 320B2:						
Frankfort-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
323B:						
Casco---------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.01
323C2:						
Casco---------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.05
323D2:						
Casco---------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.18
	Slope	0.04	Slope	0.04	Slope	0.04
323D3:						
Casco---------------	Somewhat limited		Very limited		Somewhat limited	
	Frost action	0.50	Cutbanks cave	1.00	Droughty	0.76
	Slope	0.04	Slope	0.04	Slope	0.04
325A, 325B:						
Dresden-------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Shrink-swell	0.50				
	Frost action	0.50				
327A, 327B:						
Fox-----------------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
327C2:						
Fox-----------------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
327D2:						
Fox	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Cutbanks cave	1.00	Slope	0.04
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				
365A:						
Aptakisic	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
367:						
Beach sand	Not rated		Not rated		Not rated	
370B:						
Saylesville	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Frost action	0.50	Too clayey	0.50		
370C2:						
Saylesville	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Frost action	0.50				
442A, 442B:						
Mundelein	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.75
	Frost action	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.75				
	Shrink-swell	0.50				
443A, 443B:						
Barrington	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
465A:						
Montgomery	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	1.00				
	Ponding	1.00				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
488A:						
Hooppole------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Low strength	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				
513A:						
Granby--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	0.50	Ponding	1.00	Droughty	0.01
523A:						
Dunham--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				
526A:						
Grundelein----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.75				
	Shrink-swell	0.50				
530B:						
Ozaukee-------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Frost action	0.50				
530B2:						
Ozaukee-------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
530C, 530C2, 530C3:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.08
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to saturated zone	0.08				
530D, 530D2, 530D3:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.08
	Shrink-swell	0.50	Slope	0.04	Slope	0.04
	Frost action	0.50				
	Depth to saturated zone	0.08				
	Slope	0.04				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530E, 530E2, 530F:						
Ozaukee-------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Depth to saturated zone	0.08
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to saturated zone	0.08				
531B:						
Markham-------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50				
	Frost action	0.50				
531C2:						
Markham-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to saturated zone	0.03				
531D2:						
Markham-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Slope	0.04
	Shrink-swell	0.50	Slope	0.04	Depth to saturated zone	0.02
	Frost action	0.50				
	Slope	0.04				
	Depth to saturated zone	0.02				
557A:						
Millstream----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.75
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.75				
	Shrink-swell	0.50				
570B, 570C2:						
Martinsville--------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
	Low strength	0.05				
626A:						
Kish----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
	Low strength	0.50				
	Shrink-swell	0.50				
696A, 696B, 696C2:						
Zurich--------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
696D2:						
Zurich---------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Slope	0.04
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Slope	0.04	Slope	0.04		
697A, 697B:						
Wauconda-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
698A, 689B:						
Grays----------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
706B, 706C:						
Boyer----------------	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
791A, 791B, 791C2:						
Rush-----------------	Very limited		Very limited		Not limited	
	Frost action	1.00	Cutbanks cave	1.00		
	Low strength	1.00				
	Shrink-swell	0.50				
792A, 792B:						
Bowes----------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00				
	Shrink-swell	0.50				
802B:						
Orthents, loamy------	Somewhat limited		Somewhat limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	0.47		
	Frost action	0.50				
	Low strength	0.28				
805B:						
Orthents, clayey-----	Very limited		Somewhat limited		Very limited	
	Low strength	1.00	Depth to saturated zone	0.99	Too clayey	1.00
	Shrink-swell	1.00			Droughty	0.48
	Frost action	0.50	Too clayey	0.50		
830:						
Landfills------------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Not limited		Very limited		Somewhat limited	
			Cutbanks cave	1.00	Droughty	0.99
					Too sandy	0.50
Udipsamments, Aquic	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.75	Cutbanks cave	1.00	Droughty	0.96
			Depth to saturated zone	1.00	Depth to saturated zone	0.75
					Too sandy	0.50

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
840B:						
Zurich	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
Ozaukee	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
	Frost action	0.50				
840C2:						
Zurich	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
Ozaukee	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.08
	Frost action	0.50				
	Depth to saturated zone	0.08				
865:						
Pits, gravel	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
	Frost action	0.50	Slope	1.00	Droughty	0.34
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.94
					Gravel content	0.02
978A, 978B:						
Wauconda	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
Beecher	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.99
	Low strength	1.00				
	Depth to saturated zone	0.99				
	Shrink-swell	0.50				
979A, 979B:						
Grays	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
Markham	Very limited		Very limited		Not limited	
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50				
	Frost action	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
981A, 981B:						
Wauconda------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
Frankfort-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
982A, 928B:						
Aptakisic-----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.94
	Low strength	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
Nappanee------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
983B:						
Zurich--------------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
Nappanee------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.94
	Frost action	1.00	Too clayey	0.50		
	Depth to saturated zone	0.94				
	Shrink-swell	0.50				
984B:						
Barrington----------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50				
Varna---------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
989A, 989B:						
Mundelein-----------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.75
	Frost action	1.00	Depth to saturated zone	1.00		
	Depth to saturated zone	0.75				
	Shrink-swell	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
989A, 989B:						
Elliott-------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.88
	Depth to saturated zone	0.88				
	Shrink-swell	0.50				
	Frost action	0.50				
1082A:						
Millington----------	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Flooding	0.60	Flooding	0.60
	Low strength	1.00				
	Ponding	1.00				
1103A:						
Houghton------------	Very limited		Very limited		Not rated	
	Ponding	1.00	Ponding	1.00		
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Subsidence	1.00	Content of organic matter	1.00		
	Frost action	1.00				
1107A:						
Sawmill-------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Flooding	0.80	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
1210A:						
Lena----------------	Very limited		Very limited		Not rated	
	Ponding	1.00	Ponding	1.00		
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Subsidence	1.00	Content of organic matter	1.00		
	Frost action	1.00				
1330A:						
Peotone-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00				
	Frost action	1.00				
	Shrink-swell	1.00				
1529A:						
Selmass-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
	Low strength	0.90				
	Shrink-swell	0.50				

Table 17b.--Building Site Development--Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
3107A:						
Sawmill	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Flooding	0.80	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
4103A:						
Houghton	Very limited		Very limited		Not rated	
	Ponding	1.00	Ponding	1.00		
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Subsidence	1.00	Content of organic matter	1.00		
	Frost action	1.00				
4777A:						
Adrian	Very limited		Very limited		Not rated	
	Ponding	1.00	Cutbanks cave	1.00		
	Depth to saturated zone	1.00	Ponding	1.00		
	Subsidence	1.00	Depth to saturated zone	1.00		
	Frost action	1.00	Content of organic matter	1.00		
8082A:						
Millington	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Flooding	0.60	Flooding	0.60
	Ponding	1.00				
	Low strength	0.90				

Table 18a.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
23A:				
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	1.00		
23B:				
Blount	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
67A:				
Harpster	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
103A:				
Houghton	Very limited		Very limited	
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
			Ponding	1.00
134A:				
Camden	Somewhat limited		Somewhat limited	
	Restricted permeability	0.46	Seepage	0.53
134B:				
Camden	Somewhat limited		Very limited	
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.18
146A:				
Elliott	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
146B:				
Elliott	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
			Slope	0.08
	Depth to saturated zone	1.00		

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
153A:				
Pella---------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
	Restricted permeability	0.46	Ponding	1.00
153A+:				
Pella---------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
189A:				
Martinton-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
189B:				
Martinton-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Slope	0.08
192A:				
Del Rey-------------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
192B:				
Del Rey-------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
219A:				
Millbrook-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
223B:				
Varna---------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.08

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
223C2:				
Varna---------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.68
228A:				
Nappanee------------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
228B, 228B2:				
Nappanee------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
228C2:				
Nappanee------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.68
	Depth to saturated zone	1.00		
232A:				
Ashkum--------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
298A:				
Beecher-------------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
298B:				
Beecher-------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
318C2:				
Lorenzo-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.68
320A:				
Frankfort-----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	1.00		

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
320B, 320B2:				
Frankfort-----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
323B:				
Casco---------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
323C2:				
Casco---------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.68
323D2, 323D3:				
Casco---------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	1.00
	Slope	0.04		
325A:				
Dresden-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
325B:				
Dresden-------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
	Restricted permeability	0.46		
327A:				
Fox-----------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
327B:				
Fox-----------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
	Restricted permeability	0.46		
327C2:				
Fox-----------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.68
	Restricted permeability	0.46		

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
327D2:				
Fox	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	1.00
	Slope	0.04		
330A:				
Peotone	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
365A:				
Aptakisic	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
367:				
Beach sand	Not rated		Not rated	
370B:				
Saylesville	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Slope	0.08
370C2:				
Saylesville	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Slope	0.68
442A:				
Mundelein	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
442B:				
Mundelein	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
443A:				
Barrington	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00

Table 18a.--Sanitary Facilities--Continued

<table>
<tr><th rowspan="2">Map symbol and soil name</th><th colspan="2">Septic tank absorption fields</th><th colspan="2">Sewage lagoons</th></tr>
<tr><th>Rating class and limiting features</th><th>Value</th><th>Rating class and limiting features</th><th>Value</th></tr>
<tr><td>443B:
Barrington</td><td>Very limited
Depth to saturated zone
Restricted permeability</td><td>
1.00
0.46</td><td>Very limited
Depth to saturated zone
Seepage
Slope</td><td>
1.00
1.00
0.08</td></tr>
<tr><td>465A:
Montgomery</td><td>Very limited
Restricted permeability
Depth to saturated zone
Ponding</td><td>
1.00
1.00
1.00</td><td>Very limited
Depth to saturated zone
Ponding</td><td>
1.00
1.00</td></tr>
<tr><td>488A:
Hooppole</td><td>Very limited
Depth to saturated zone
Filtering capacity
Ponding
Restricted permeability</td><td>
1.00
1.00
1.00
0.46</td><td>Very limited
Seepage
Depth to saturated zone
Ponding</td><td>
1.00
1.00
1.00</td></tr>
<tr><td>513A:
Granby</td><td>Very limited
Depth to saturated zone
Filtering capacity
Ponding</td><td>
1.00
1.00
1.00</td><td>Very limited
Seepage
Depth to saturated zone
Ponding</td><td>
1.00
1.00
1.00</td></tr>
<tr><td>523A:
Dunham</td><td>Very limited
Depth to saturated zone
Filtering capacity
Ponding
Restricted permeability</td><td>
1.00
1.00
1.00
0.46</td><td>Very limited
Seepage
Depth to saturated zone
Ponding</td><td>
1.00
1.00
1.00</td></tr>
<tr><td>526A:
Grundelein</td><td>Very limited
Depth to saturated zone
Filtering capacity
Restricted permeability</td><td>
1.00
1.00
0.46</td><td>Very limited
Seepage
Depth to saturated zone</td><td>
1.00
1.00</td></tr>
<tr><td>530B, 530B2:
Ozaukee</td><td>Very limited
Restricted permeability
Depth to saturated zone</td><td>
1.00
1.00</td><td>Somewhat limited
Depth to saturated zone
Slope</td><td>
0.96
0.08</td></tr>
</table>

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
530C, 530C2, 530C3:				
Ozaukee	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.68
	Depth to saturated zone	1.00	Depth to saturated zone	0.44
530D, 530D2, 530D3:				
Ozaukee	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.44
	Slope	0.04		
530E, 530E2, 530F:				
Ozaukee	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.44
	Slope	1.00		
531B:				
Markham	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.81
	Depth to saturated zone	1.00	Slope	0.08
531C2:				
Markham	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.68
	Depth to saturated zone	1.00	Depth to saturated zone	0.56
531D2:				
Markham	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	0.64
	Slope	0.04		
557A:				
Millstream	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46		
570B:				
Martinsville	Somewhat limited		Very limited	
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
570C2:				
Martinsville	Somewhat limited		Somewhat limited	
	Restricted permeability	0.46	Slope	0.68
			Seepage	0.53
626A:				
Kish	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
	Restricted permeability	0.46	Ponding	1.00
696A:				
Zurich	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
696B:				
Zurich	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
696C2:				
Zurich	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.68
696D2:				
Zurich	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Slope	1.00
			Seepage	1.00
	Slope	0.04		
697A:				
Wauconda	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
697B:				
Wauconda	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
698A:				
Grays	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
698B:				
Grays	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
706B:				
Boyer	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
706C:				
Boyer	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.68
791A:				
Rush	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
791B:				
Rush	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
	Restricted permeability	0.46		
791C2:				
Rush	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.68
	Restricted permeability	0.46		
792A:				
Bowes	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
792B:				
Bowes	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.08
	Restricted permeability	0.46		

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
802B:				
Orthents, loamy-----	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.39
	Depth to saturated zone	0.94	Slope	0.18
805B:				
Orthents, clayey----	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.08
830:				
Landfills-----------	Not rated		Not rated	
839B:				
Udipsamments, Typic	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.18
Udipsamments, Aquic	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
840B:				
Zurich-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Ozaukee------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.08
840C2:				
Zurich-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.68
Ozaukee------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.68
	Depth to saturated zone	1.00	Depth to saturated zone	0.44
865:				
Pits, gravel--------	Not rated		Not rated	

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
969E2, 969F:				
Casco	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Rodman	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
978A:				
Wauconda	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
Beecher	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
978B:				
Wauconda	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Beecher	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
979A:				
Grays	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
Markham	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.81
	Depth to saturated zone	1.00		
979B:				
Grays	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
979B:				
Markham------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.81
	Depth to saturated zone	1.00	Slope	0.08
981A:				
Wauconda-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
Frankfort----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	1.00		
981B:				
Wauconda-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Frankfort----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
982A:				
Aptakisic----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
Nappanee-----------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
982B:				
Aptakisic----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Nappanee-----------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
983B:				
Zurich---------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Nappanee------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Slope	0.08
	Depth to saturated zone	1.00		
984B:				
Barrington----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Varna---------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Depth to saturated zone	0.96
	Depth to saturated zone	1.00	Slope	0.08
989A:				
Mundelein-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
Elliott-------------	Very limited		Not limited	
	Restricted permeability	1.00		
	Depth to saturated zone	1.00		
989B:				
Mundelein-----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	1.00
			Slope	0.08
Elliott-------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
			Slope	0.08
	Depth to saturated zone	1.00		
1082A:				
Millington----------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
1103A:				
Houghton------------	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00
			Seepage	1.00
1107A:				
Sawmill-------------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
1210A:				
Lena----------------	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Seepage	1.00
			Depth to saturated zone	1.00
1330A:				
Peotone-------------	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
1529A:				
Selmass-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
3107A:				
Sawmill-------------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53

Table 18a.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
4103A:				
Houghton------------	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Content of organic matter	1.00
	Subsidence	1.00	Depth to saturated zone	1.00
			Seepage	1.00
4777A:				
Adrian--------------	Very limited		Very limited	
	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Seepage	1.00
	Filtering capacity	1.00	Depth to saturated zone	1.00
	Subsidence	1.00	Content of organic matter	1.00
8082A:				
Millington----------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53

Table 18b.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
67A:						
Harpster------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50
103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
			Ponding	1.00		
	Seepage	1.00			Ponding	1.00
	Ponding	1.00			Seepage	0.16
134A, 134B:						
Camden--------------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
146A, 146B:						
Elliott-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
153A, 153A+:						
Pella---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50				
189A, 189B:						
Martinton-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
192A, 192B:						
Del Rey-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
219A:						
Millbrook----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00			Too sandy	0.50
	Seepage	1.00			Seepage	0.22
223B, 223C2:						
Varna---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
228A, 228B, 228B2, 228C2:						
Nappanee----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
232A:						
Ashkum-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50
298A, 298B:						
Beecher------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
318C2:						
Lorenzo------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00			Gravel content	0.77
					Too sandy	0.50
320A, 320B, 320B2:						
Frankfort----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
323B, 323C2:						
Casco--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
					Gravel content	0.23
323D2, 323D3:						
Casco--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.04	Seepage	1.00
	Slope	0.04			Gravel content	0.29
					Slope	0.04
325A, 325B:						
Dresden------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
327A, 327B, 327C2:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
327D2:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	0.04	Seepage	1.00
	Slope	0.04			Slope	0.04
					Gravel content	0.04
330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Ponding	1.00
365A:						
Aptakisic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	0.50
	Seepage	1.00			Seepage	0.22
367:						
Beach sand	Not rated		Not rated		Not rated	
370B, 370C2:						
Saylesville	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
442A, 442B:						
Mundelein	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00			Seepage	0.22
443A, 443B:						
Barrington	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.24
	Seepage	1.00			Seepage	0.22
465A:						
Montgomery	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
488A:						
Hooppole	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
513A:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Ponding	1.00	Seepage	1.00
	Ponding	1.00			Ponding	1.00
523A:						
Dunham	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Too clayey	0.50
	Too clayey	0.50				
526A:						
Grundelein	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too clayey	0.50
	Too clayey	0.50				
530B, 530B2:						
Ozaukee	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
530C, 530C2, 530C3:						
Ozaukee	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Hard to compact	1.00
	Too clayey	0.50			Depth to saturated zone	0.76
					Too clayey	0.50
530D, 530D2, 530D3:						
Ozaukee	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Hard to compact	1.00
	Too clayey	0.50	Slope	0.04	Depth to saturated zone	0.76
	Slope	0.04			Too clayey	0.50
					Slope	0.04
530E, 530E2, 530F:						
Ozaukee	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.76
	Too clayey	0.50			Too clayey	0.50
531B:						
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47
531C2:						
Markham	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.68
	Too clayey	0.50			Too clayey	0.50

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
531D2:						
Markham-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.93	Depth to saturated zone	0.93	Depth to saturated zone	0.62
	Too clayey	0.50	Slope	0.04	Too clayey	0.50
	Slope	0.04			Slope	0.04
557A:						
Millstream----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00				
570B:						
Martinsville--------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
570C2:						
Martinsville--------	Very limited		Not limited		Not limited	
	Seepage	1.00				
626A:						
Kish----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
696A:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
					Depth to saturated zone	0.24
	Too sandy	1.00	Seepage	1.00		
	Seepage	1.00			Seepage	0.22
696B:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
					Depth to saturated zone	0.24
	Too sandy	1.00	Seepage	1.00		
	Seepage	1.00			Seepage	0.22
696C2:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
					Depth to saturated zone	0.24
	Too sandy	1.00				
	Seepage	1.00			Seepage	0.22
696D2:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
					Depth to saturated zone	0.24
	Too sandy	1.00	Seepage	1.00		
	Seepage	1.00	Slope	0.04	Seepage	0.22
	Slope	0.04			Slope	0.04

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
697A:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	0.50
	Seepage	1.00			Seepage	0.22
697B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too clayey	0.50
	Too clayey	0.50				
698A:						
Grays---------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.24
	Too clayey	0.50				
698B:						
Grays---------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.24
	Too clayey	0.50				
706B:						
Boyer---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
706C:						
Boyer---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
791A:						
Rush----------------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
791B:						
Rush----------------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
791C2:						
Rush----------------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
792A:						
Bowes---------------	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
792B:						
Bowes---------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Seepage	1.00	Too clayey	0.50
	Too clayey	0.50				

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
802B:						
Orthents, loamy-----	Not limited		Not limited		Not limited	
805B:						
Orthents, clayey----	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.68	Too clayey	1.00
	Depth to saturated zone	0.68			Depth to saturated zone	0.24
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
Udipsamments, Aquic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00			Depth to saturated zone	1.00
840B:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Too sandy	1.00	Seepage	1.00	Depth to saturated zone	0.24
	Seepage	1.00			Seepage	0.22
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
840C2:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Too sandy	1.00			Depth to saturated zone	0.24
	Seepage	1.00			Seepage	0.22
Ozaukee-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.98	Depth to saturated zone	0.98	Depth to saturated zone	0.76
	Too clayey	0.50			Too clayey	0.50
865:						
Pits, gravel--------	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco---------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00	Slope	1.00	Seepage	1.00
	Slope	1.00			Slope	1.00
					Gravel content	0.20
Rodman--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	1.00	Slope	1.00	Gravel content	1.00
	Slope	1.00			Slope	1.00
					Too sandy	0.50

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
978A:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	0.50
	Seepage	1.00			Seepage	0.22
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
978B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too clayey	0.50
	Too clayey	0.50				
Beecher-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
979A, 979B:						
Grays---------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.24
	Too clayey	0.50				
Markham-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47
981A:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	0.50
	Seepage	1.00			Seepage	0.22
Frankfort-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
981B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too clayey	0.50
	Too clayey	0.50				
Frankfort-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
982A, 982B:						
Aptakisic-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too sandy	1.00	Seepage	1.00	Too sandy	0.50
	Seepage	1.00			Seepage	0.22
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
983B:						
Zurich--------------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Too sandy	1.00	Seepage	1.00	Depth to saturated zone	0.24
	Seepage	1.00			Seepage	0.22
Nappanee------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
984B:						
Barrington----------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.24
	Too clayey	0.50				
Varna---------------	Very limited		Somewhat limited		Very limited	
	Too clayey	1.00	Depth to saturated zone	0.68	Too clayey	1.00
	Depth to saturated zone	0.68			Depth to saturated zone	0.24
989A, 989B:						
Mundelein-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00			Seepage	0.22
Elliott-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
1082A:						
Millington----------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
1103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00			Seepage	0.16

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1107A:						
Sawmill	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Too clayey	0.50
	Too clayey	0.50				
1210A:						
Lena	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Content of organic matter	1.00
	Content of organic matter	1.00			Seepage	0.52
1330A:						
Peotone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
1529A:						
Selmass	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Seepage	0.22
3107A:						
Sawmill	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00	Too clayey	0.50
	Too clayey	0.50				
4103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Content of organic matter	1.00	Seepage	1.00	Content of organic matter	1.00
	Seepage	1.00			Seepage	0.16
4777A:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00

Table 18b.--Sanitary Facilities--Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8082A:						
Millington----------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		

Table 19a.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
23A, 23B:				
Blount	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
67A:				
Harpster	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
103A:				
Houghton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
134A, 134B:				
Camden	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
146A, 146B:				
Elliott	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
153A, 153A+:				
Pella	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
189A, 189B:				
Martinton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
192A, 192B:				
Del Rey	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
219A:				
Millbrook	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
223B, 223C2:				
Varna	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
228A, 228B, 228B2, 228C2:				
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
232A:				
Ashkum	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
298A, 298B:				
Beecher	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
318C2:				
Lorenzo	Fair		Fair	
	Thickest layer	0.16	Thickest layer	0.78
	Bottom layer	0.81	Bottom layer	0.78
320A, 320B, 320B2:				
Frankfort	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
323B, 323C2, 323D2, 323D3:				
Casco	Fair		Fair	
	Thickest layer	0.16	Thickest layer	0.82
	Bottom layer	0.86	Bottom layer	0.82
325A, 325B:				
Dresden	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.56
	Bottom layer	0.71	Bottom layer	0.69
327A, 327B, 327C2, 327D2:				
Fox	Fair		Fair	
	Thickest layer	0.16	Thickest layer	0.56
	Bottom layer	0.93	Bottom layer	0.89
330A:				
Peotone	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
365A:				
Aptakisic	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
367:				
Beach sand	Not rated		Not rated	
370B, 370C2:				
Saylesville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
442A:				
Mundelein	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
442B:				
Mundelein-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
443A, 443B:				
Barrington----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
465A:				
Montgomery----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
488A:				
Hooppole------------	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.50
513A:				
Granby--------------	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.50
	Bottom layer	0.00	Bottom layer	0.50
523A:				
Dunham--------------	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.50	Bottom layer	0.89
526A:				
Grundelein----------	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.50	Bottom layer	0.89
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3, 530E, 530E2, 530F:				
Ozaukee------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
531B, 531C2, 531D2:				
Markham-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
557A:				
Millstream----------	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.50	Bottom layer	0.89
570B, 570C2:				
Martinsville--------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
626A:				
Kish----------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
696A, 696B, 696C2, 696D2:				
Zurich	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
697A, 697B:				
Wauconda	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
698A, 698B:				
Grays	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
706B, 706C:				
Boyer	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.50
	Bottom layer	0.00	Bottom layer	0.50
791A, 791B, 791C2:				
Rush	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.50	Bottom layer	0.91
792A, 792B:				
Bowes	Fair		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.79	Bottom layer	0.76
802B:				
Orthents, loamy	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
805B:				
Orthents, clayey	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
830:				
Landfills	Not rated		Not rated	
839B:				
Udipsamments, Typic	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.50
	Bottom layer	0.00	Bottom layer	0.50
Udipsamments, Aquic	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.50
	Bottom layer	0.00	Bottom layer	0.50
840B, 840C2:				
Zurich	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Ozaukee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
865:				
Pits, gravel	Not rated		Not rated	
969E2, 969F:				
Casco	Fair		Fair	
	Thickest layer	0.16	Thickest layer	0.82
	Bottom layer	0.86	Bottom layer	0.82
Rodman	Good		Fair	
	Bottom layer	0.95	Thickest layer	0.91
			Bottom layer	0.91
978A, 978B:				
Wauconda	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Beecher	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
979A, 979B:				
Grays	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Markham	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
981A, 981B:				
Wauconda	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Frankfort	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
982A, 982B:				
Aptakisic	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
983B:				
Zurich	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Nappanee	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
984B:				
Barrington	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel: Rating class	Value	Potential as source of sand: Rating class	Value
984B:				
Varna	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
989A, 989B:				
Mundelein	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Elliott	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1082A:				
Millington	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1103A:				
Houghton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1107A:				
Sawmill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1210A:				
Lena	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1330A:				
Peotone	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
1529A:				
Selmass	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.50
3107A:				
Sawmill	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
4103A:				
Houghton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
4777A:				
Adrian	Poor		Fair	
	Thickest layer	0.00	Thickest layer	0.50
	Bottom layer	0.00	Bottom layer	0.50

Table 19a.--Construction Materials--Continued

Map symbol and soil name	Potential as source of gravel		Potential as source of sand	
	Rating class	Value	Rating class	Value
8082A:				
Millington----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 19b.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount--------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.01	Depth to saturated zone	0.01
	Carbonate content	0.68			Hard to reclaim	0.20
	Water erosion	0.90				
67A:						
Harpster------------	Fair		Poor		Poor	
	Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.92				
	Water erosion	0.99	Low strength	0.00	Too clayey	0.72
			Shrink-swell	0.99		
103A:						
Houghton------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Content of organic matter	0.00
134A:						
Camden--------------	Fair		Fair		Good	
	Low content of organic matter	0.08	Shrink-swell	0.92		
	Water erosion	0.68				
134B:						
Camden--------------	Fair		Poor		Good	
	Water erosion	0.68	Low strength	0.00		
	Low content of organic matter	0.68	Shrink-swell	0.94		
146A:						
Elliott-------------	Fair		Poor		Fair	
	Low content of organic matter	0.18	Low strength	0.00	Depth to saturated zone	0.07
			Depth to saturated zone	0.07		
	Carbonate content	0.84			Too clayey	0.55
	Too clayey	0.92	Shrink-swell	0.97		
	Water erosion	0.99				
146B:						
Elliott-------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.07
			Depth to saturated zone	0.07		
	Carbonate content	0.84			Too clayey	0.55
	Water erosion	0.90			Hard to reclaim	0.90
	Too clayey	0.92				
153A:						
Pella---------------	Fair		Poor		Poor	
	Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.98				
	Water erosion	0.99	Low strength	0.00	Too clayey	0.81
			Shrink-swell	0.99		

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
153A+:						
Pella---------------	Fair		Poor		Poor	
	Carbonate content	0.80	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00		
			Shrink-swell	0.93		
189A:						
Martinton-----------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.02
	Carbonate content	0.97	Depth to saturated zone	0.14	Depth to saturated zone	0.14
	Water erosion	0.99	Shrink-swell	0.89		
189B:						
Martinton-----------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.02
	Low content of organic matter	0.12	Depth to saturated zone	0.14	Depth to saturated zone	0.14
	Carbonate content	0.97	Shrink-swell	0.87		
	Water erosion	0.99				
192A:						
Del Rey-------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.50	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.80	Shrink-swell	0.87	Too acid	0.99
	Water erosion	0.99				
192B:						
Del Rey-------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.08	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.80	Shrink-swell	0.87		
	Water erosion	0.90				
219A:						
Millbrook-----------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.90			Too acid	0.99
223B:						
Varna---------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.97	Shrink-swell	0.97	Depth to saturated zone	0.98
	Water erosion	0.99	Depth to saturated zone	0.98		
223C2:						
Varna---------------	Fair		Poor		Fair	
	Too clayey	0.08	Low strength	0.00	Too clayey	0.06
	Low content of organic matter	0.68	Shrink-swell	0.95	Depth to saturated zone	0.98
	Carbonate content	0.97	Depth to saturated zone	0.98		
	Water erosion	0.99				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
228A:						
Nappanee------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.68	Shrink-swell	0.87		
	Water erosion	0.99				
228B, 228B2:						
Nappanee------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.24	Depth to saturated zone	0.04	Hard to reclaim	0.03
	Carbonate content	0.68	Shrink-swell	0.87	Depth to saturated zone	0.04
	Water erosion	0.99			Carbonate content	0.92
228C2:						
Nappanee------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.68	Shrink-swell	0.87	Hard to reclaim	0.05
	Droughty	0.87				
	Water erosion	0.99				
232A:						
Ashkum--------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.18	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.97	Shrink-swell	0.60		
	Water erosion	0.99				
298A:						
Beecher-------------	Fair		Poor		Fair	
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.01
	Carbonate content	0.84	Depth to saturated zone	0.01	Too clayey	0.55
	Water erosion	0.90			Hard to reclaim	0.97
	Too clayey	0.92				
298B:						
Beecher-------------	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.08	Low strength	0.00	Too clayey	0.01
	Carbonate content	0.84			Hard to reclaim	0.94
	Water erosion	0.90				
318C2:						
Lorenzo-------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Low content of organic matter	0.12			Rock fragments	0.00
	Droughty	0.28			Hard to reclaim	0.00
	Carbonate content	0.46			Carbonate content	0.46

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
320A, 320B:						
Frankfort----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.84	Shrink-swell	0.91	Hard to reclaim	0.84
	Water erosion	0.99				
320B2:						
Frankfort----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Droughty	0.77	Shrink-swell	0.87	Hard to reclaim	0.90
	Carbonate content	0.84				
	Water erosion	0.99				
323B, 323C2:						
Casco--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Low content of organic matter	0.12			Rock fragments	0.00
					Hard to reclaim	0.00
	Droughty	0.53				
323D2:						
Casco--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Low content of organic matter	0.12			Rock fragments	0.00
					Hard to reclaim	0.00
	Droughty	0.24			Slope	0.96
323D3:						
Casco--------------	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Droughty	0.02			Rock fragments	0.00
	Low content of organic matter	0.12			Hard to reclaim	0.00
					Slope	0.96
325A, 325B:						
Dresden------------	Fair		Good		Poor	
	Low content of organic matter	0.12			Hard to reclaim	0.00
	Carbonate content	0.46				
327A, 327B, 327C2:						
Fox----------------	Fair		Good		Poor	
	Low content of organic matter	0.12			Hard to reclaim	0.00
					Too clayey	0.53
	Carbonate content	0.68				
	Too clayey	0.92				
327D2:						
Fox----------------	Fair		Good		Poor	
	Low content of organic matter	0.12			Hard to reclaim	0.00
					Too clayey	0.53
	Carbonate content	0.68			Slope	0.96
	Too clayey	0.92				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
330A:						
Peotone-------------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00	Too clayey	0.00
			Shrink-swell	0.12		
365A:						
Aptakisic-----------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.68			Too clayey	0.67
	Carbonate content	0.97				
	Too clayey	0.98				
367:						
Beach sand----------	Not rated		Not rated		Not rated	
370B:						
Saylesville---------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.11
	Too clayey	0.18	Shrink-swell	0.87	Depth to saturated zone	0.98
	Carbonate content	0.80	Depth to saturated zone	0.98		
	Water erosion	0.90				
370C2:						
Saylesville---------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Shrink-swell	0.87	Depth to saturated zone	0.98
	Carbonate content	0.80	Depth to saturated zone	0.98		
	Water erosion	0.90				
442A, 442B:						
Mundelein-----------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.14	Depth to saturated zone	0.14
	Carbonate content	0.97				
	Water erosion	0.99				
443A:						
Barrington----------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Carbonate content	0.97				
	Water erosion	0.99				
443B:						
Barrington----------	Fair		Poor		Fair	
	Carbonate content	0.97	Low strength	0.00	Depth to saturated zone	0.98
	Water erosion	0.99	Depth to saturated zone	0.98		
465A:						
Montgomery----------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Carbonate content	0.92	Low strength	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.40		

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
488A:						
Hooppole------------	Fair		Poor		Poor	
	Carbonate content	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Carbonate content	0.88
513A:						
Granby--------------	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.12			Too sandy	0.00
523A:						
Dunham--------------	Fair		Poor		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Low strength	0.00	Hard to reclaim	0.08
			Shrink-swell	0.98		
526A:						
Grundelein----------	Fair		Poor		Fair	
	Carbonate content	0.46	Low strength	0.00	Hard to reclaim	0.08
	Water erosion	0.99	Depth to saturated zone	0.14	Depth to saturated zone	0.14
530B:						
Ozaukee-------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.19
	Too clayey	0.32	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Carbonate content	0.68				
	Water erosion	0.90				
530B2:						
Ozaukee-------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Hard to reclaim	0.29
	Carbonate content	0.68			Depth to saturated zone	0.98
	Water erosion	0.90				
530C:						
Ozaukee-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.24	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Carbonate content	0.68			Hard to reclaim	0.99
	Water erosion	0.90				
530C2:						
Ozaukee-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.68	Hard to reclaim	0.35
	Carbonate content	0.68			Depth to saturated zone	0.68
	Water erosion	0.90				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
530C3:						
Ozaukee	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.95	Hard to reclaim	0.84
	Carbonate content	0.68			Depth to saturated zone	0.95
	Water erosion	0.90				
530D:						
Ozaukee	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.24	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Carbonate content	0.68			Slope	0.96
	Water erosion	0.90				
530D2:						
Ozaukee	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.68	Hard to reclaim	0.35
	Carbonate content	0.68			Depth to saturated zone	0.68
	Water erosion	0.90			Slope	0.96
530D3:						
Ozaukee	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.19
	Too clayey	0.32	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Carbonate content	0.68			Slope	0.96
	Water erosion	0.90			Hard to reclaim	0.97
530E:						
Ozaukee	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
	Carbonate content	0.68	Depth to saturated zone	0.68	Hard to reclaim	0.16
	Water erosion	0.90	Slope	0.98	Too clayey	0.57
	Too clayey	0.98			Depth to saturated zone	0.68
					Carbonate content	0.68
530E2:						
Ozaukee	Fair		Poor		Poor	
	Too clayey	0.02	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.68	Too clayey	0.01
	Carbonate content	0.68	Slope	0.98	Hard to reclaim	0.65
	Water erosion	0.90			Depth to saturated zone	0.68
530F:						
Ozaukee	Fair		Poor		Poor	
	Too clayey	0.02	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.24	Slope	0.00	Too clayey	0.01
	Carbonate content	0.68	Depth to saturated zone	0.98	Hard to reclaim	0.94
	Water erosion	0.90			Depth to saturated zone	0.98

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
531B, 531C2:						
Markham-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.76	Hard to reclaim	0.46
	Water erosion	0.90			Depth to saturated zone	0.76
	Carbonate content	0.97				
531D2:						
Markham-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.80	Hard to reclaim	0.54
	Water erosion	0.90			Depth to saturated zone	0.80
	Carbonate content	0.97			Slope	0.96
557A:						
Millstream----------	Fair		Fair		Fair	
	Low content of organic matter	0.18	Depth to saturated zone	0.14	Hard to reclaim	0.08
	Carbonate content	0.46	Shrink-swell	0.99	Depth to saturated zone	0.14
	Water erosion	0.90				
570B:						
Martinsville--------	Fair		Fair		Good	
	Low content of organic matter	0.68				
	Water erosion	0.99				
570C2:						
Martinsville--------	Fair		Good		Good	
	Low content of organic matter	0.18				
626A:						
Kish----------------	Fair		Poor		Poor	
	Carbonate content	0.68	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.22		
			Shrink-swell	0.97		
696A, 696B, 696C2:						
Zurich--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.68				
	Carbonate content	0.97				
696D2:						
Zurich--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Slope	0.96
	Water erosion	0.90			Depth to saturated zone	0.98
	Carbonate content	0.97				
697A:						
Wauconda------------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.90				
	Carbonate content	0.97				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
697B:						
Wauconda------------	Fair		Poor		Fair	
	Low content of organic matter	0.68	Low strength	0.00	Depth to saturated zone	0.04
	Carbonate content	0.97	Depth to saturated zone	0.04		
	Water erosion	0.99				
698A, 698B:						
Grays---------------	Fair		Poor		Fair	
	Low content of organic matter	0.68	Low strength	0.00	Depth to saturated zone	0.98
	Water erosion	0.90	Depth to saturated zone	0.98		
	Carbonate content	0.97				
706B, 706C:						
Boyer---------------	Fair		Good		Fair	
	Low content of organic matter	0.08			Rock fragments	0.50
	Carbonate content	0.68				
	Droughty	0.97				
791A, 791B, 791C2:						
Rush----------------	Fair		Poor		Fair	
	Water erosion	0.68	Low strength	0.00	Hard to reclaim	0.68
	Carbonate content	0.80	Shrink-swell	0.98		
	Low content of organic matter	0.88				
792A, 792B:						
Bowes---------------	Fair		Poor		Fair	
	Carbonate content	0.68	Low strength	0.00	Hard to reclaim	0.32
	Low content of organic matter	0.68	Shrink-swell	0.96	Too clayey	0.67
	Water erosion	0.90				
	Too clayey	0.98				
802B:						
Orthents, loamy-----	Fair		Fair		Good	
	Low content of organic matter	0.68	Low strength	0.78		
	Water erosion	0.90	Shrink-swell	0.87		
805B:						
Orthents, clayey----	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Hard to reclaim	0.00
	Droughty	0.50	Shrink-swell	0.12	Too clayey	0.00
	Low content of organic matter	0.68	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.90				
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Poor		Good		Poor	
	Too sandy	0.00			Too sandy	0.00
	Wind erosion	0.00			Rock fragments	0.97
	Droughty	0.01			Carbonate content	0.99
	Low content of organic matter	0.08				
	Carbonate content	0.99				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
839B:						
Udipsamments, Aquic	Poor		Fair		Poor	
	Too sandy	0.00	Depth to saturated zone	0.14	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.14
	Droughty	0.02			Rock fragments	0.97
	Low content of organic matter	0.08			Carbonate content	0.99
	Carbonate content	0.99				
840B:						
Zurich--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.68				
	Carbonate content	0.97				
Ozaukee-------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.19
	Too clayey	0.32	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Carbonate content	0.68				
	Water erosion	0.90				
840C2:						
Zurich--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.90				
	Carbonate content	0.97				
Ozaukee-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.68	Hard to reclaim	0.35
	Carbonate content	0.68			Depth to saturated zone	0.68
	Water erosion	0.90				
865:						
Pits, gravel--------	Not rated		Not rated		Not rated	
969E2:						
Casco---------------	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.98	Too sandy	0.00
	Low content of organic matter	0.12			Slope	0.00
	Droughty	0.41			Rock fragments	0.00
					Hard to reclaim	0.00
Rodman--------------	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.98	Too sandy	0.00
	Droughty	0.00			Hard to reclaim	0.00
	Carbonate content	0.46			Rock fragments	0.00
	Low content of organic matter	0.50			Slope	0.00
					Carbonate content	0.46
969F:						
Casco---------------	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Low content of organic matter	0.12			Too sandy	0.00
	Droughty	0.15			Rock fragments	0.00
					Hard to reclaim	0.00

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
969F:						
Rodman--------------	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Droughty	0.00			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
978A:						
Wauconda------------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.90				
	Carbonate content	0.97				
Beecher-------------	Fair		Poor		Fair	
	Low content of organic matter	0.08	Low strength	0.00	Depth to saturated zone	0.01
	Carbonate content	0.84	Depth to saturated zone	0.01	Too clayey	0.55
	Water erosion	0.90			Hard to reclaim	0.97
	Too clayey	0.92				
978B:						
Wauconda------------	Fair		Poor		Fair	
	Low content of organic matter	0.68	Low strength	0.00	Depth to saturated zone	0.04
	Carbonate content	0.97	Depth to saturated zone	0.04		
	Water erosion	0.99				
Beecher-------------	Fair		Poor		Poor	
	Too clayey	0.02	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.08	Low strength	0.00	Too clayey	0.01
	Carbonate content	0.84			Hard to reclaim	0.94
	Water erosion	0.90				
979A, 979B:						
Grays---------------	Fair		Poor		Fair	
	Low content of organic matter	0.68	Low strength	0.00	Depth to saturated zone	0.98
	Water erosion	0.90	Depth to saturated zone	0.98		
	Carbonate content	0.97				
Markham-------------	Fair		Poor		Fair	
	Too clayey	0.02	Low strength	0.00	Too clayey	0.01
	Low content of organic matter	0.12	Depth to saturated zone	0.89	Depth to saturated zone	0.89
	Water erosion	0.90			Hard to reclaim	0.97
	Carbonate content	0.97				
981A:						
Wauconda------------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.90				
	Carbonate content	0.97				

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
981A:						
Frankfort-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.84	Shrink-swell	0.91	Hard to reclaim	0.84
	Water erosion	0.99				
981B:						
Wauconda------------	Fair		Poor		Fair	
	Low content of organic matter	0.68	Low strength	0.00	Depth to saturated zone	0.04
	Carbonate content	0.97	Depth to saturated zone	0.04		
	Water erosion	0.99				
Frankfort-----------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.84	Shrink-swell	0.89	Hard to reclaim	0.97
	Water erosion	0.99				
982A, 982B:						
Aptakisic-----------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Water erosion	0.68			Too clayey	0.67
	Carbonate content	0.97				
	Too clayey	0.98				
Nappanee------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.24	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.68	Shrink-swell	0.87	Carbonate content	0.92
	Water erosion	0.99				
983B:						
Zurich--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.68				
	Carbonate content	0.97				
Nappanee------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Low content of organic matter	0.24	Depth to saturated zone	0.04	Depth to saturated zone	0.04
	Carbonate content	0.68	Shrink-swell	0.87	Carbonate content	0.92
	Water erosion	0.99				
984B:						
Barrington----------	Fair		Poor		Fair	
	Carbonate content	0.97	Low strength	0.00	Depth to saturated zone	0.98
	Water erosion	0.99	Depth to saturated zone	0.98		
Varna---------------	Poor		Poor		Poor	
	Too clayey	0.00	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.97	Shrink-swell	0.97	Depth to saturated zone	0.98
	Water erosion	0.99	Depth to saturated zone	0.98		

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material: Rating class and limiting features	Value	Potential as source of roadfill: Rating class and limiting features	Value	Potential as source of topsoil: Rating class and limiting features	Value
989A:						
Mundelein-----------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.14	Depth to saturated zone	0.14
	Carbonate content	0.97				
	Water erosion	0.99				
Elliott-------------	Fair		Poor		Fair	
	Low content of organic matter	0.18	Low strength	0.00	Depth to saturated zone	0.07
			Depth to saturated zone	0.07		
	Carbonate content	0.84			Too clayey	0.55
	Too clayey	0.92	Shrink-swell	0.97		
	Water erosion	0.99				
989B:						
Mundelein-----------	Fair		Fair		Fair	
	Low content of organic matter	0.02	Depth to saturated zone	0.14	Depth to saturated zone	0.14
	Carbonate content	0.97				
	Water erosion	0.99				
Elliott-------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.07
			Depth to saturated zone	0.07		
	Carbonate content	0.84			Too clayey	0.55
	Water erosion	0.90			Hard to reclaim	0.90
	Too clayey	0.92				
1082A:						
Millington----------	Fair		Poor		Poor	
	Carbonate content	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.96		
1103A:						
Houghton------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Content of organic matter	0.00
1107A:						
Sawmill-------------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.98
			Shrink-swell	0.87		
1210A:						
Lena----------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Content of organic matter	0.00
1330A:						
Peotone-------------	Fair		Poor		Poor	
	Too clayey	0.24	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99				
			Low strength	0.00	Too clayey	0.24
			Shrink-swell	0.12		

Table 19b.--Construction Materials--Continued

Map symbol and soil name	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1529A:						
Selmass-------------	Good		Poor		Poor	
			Depth to saturated zone	0.00	Depth to saturated zone	0.00
3107A:						
Sawmill-------------	Fair		Poor		Poor	
	Too clayey	0.98	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00	Too clayey	0.98
			Shrink-swell	0.87		
4103A:						
Houghton------------	Poor		Poor		Poor	
	Wind erosion	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Content of organic matter	0.00
4777A:						
Adrian--------------	Poor		Poor		Poor	
	Too sandy	0.00	Depth to saturated zone	0.00	Too sandy	0.00
	Wind erosion	0.00			Depth to saturated zone	0.00
	Low content of organic matter	0.50				
8082A:						
Millington----------	Fair		Poor		Poor	
	Carbonate content	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.98		

Table 20a.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount	Somewhat limited		Very limited		Very limited	
	Seepage	0.02	Depth to saturated zone	1.00	Depth to water	1.00
			Piping	0.04		
67A:						
Harpster	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
					Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.22		
103A:						
Houghton	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Content of organic matter	1.00		
			Depth to saturated zone	1.00		
134A, 134B:						
Camden	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.96	Depth to water	1.00
			Seepage	0.02		
146A, 146B:						
Elliott	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
			Piping	0.57		
153A, 153A+:						
Pella	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Ponding	1.00		
			Piping	0.15		
189A, 189B:						
Martinton	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
192A, 192B:						
Del Rey	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
219A:						
Millbrook	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.88		

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
223B, 223C2:						
Varna	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.68	Depth to water	1.00
228A, 228B, 228B2, 228C2:						
Nappanee	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
232A:						
Ashkum	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
			Ponding	1.00		
298A, 298B:						
Beecher	Somewhat limited		Very limited		Very limited	
	Seepage	0.02	Depth to saturated zone	1.00	Depth to water	1.00
			Piping	0.39		
318C2:						
Lorenzo	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.31	Depth to water	1.00
320A, 320B, 320B2:						
Frankfort	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
323B, 323C2, 323D2, 323D3:						
Casco	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.31	Depth to water	1.00
325A, 325B:						
Dresden	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.26	Depth to water	1.00
327A, 327B, 327C2, 327D2:						
Fox	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.31	Depth to water	1.00
330A:						
Peotone	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.04	Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
			Ponding	1.00		
			Hard to pack	0.19		
365A:						
Aptakisic	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.99		
367:						
Beach sand	Not rated		Not rated		Not rated	

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
370B, 370C2:						
Saylesville----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.04	Depth to saturated zone	0.68	Slow refill	0.96
					Depth to water	0.14
					Cutbanks cave	0.10
442A, 442B:						
Mundelein-----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.71		
443A, 443B:						
Barrington----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.79	Cutbanks cave	1.00
			Depth to saturated zone	0.68	Depth to water	0.14
465A:						
Montgomery----------	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone	1.00	Slow refill	0.96
			Ponding	1.00	Cutbanks cave	0.10
			Hard to pack	0.50		
488A:						
Hooppole------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Ponding	1.00		
			Piping	1.00		
			Seepage	0.50		
513A:						
Granby--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Ponding	1.00		
			Seepage	0.43		
523A:						
Dunham--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Ponding	1.00		
			Piping	0.63		
			Seepage	0.15		
526A:						
Grundelein----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	1.00		
			Seepage	0.15		
530B, 530B2:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.68	Depth to water	1.00

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530C, 530C2:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.98	Depth to water	1.00
530C3:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.75	Depth to water	1.00
530D, 530D2:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.98	Depth to water	1.00
530D3:						
Ozaukee-------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
530E:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.98	Depth to water	1.00
	Seepage	0.02				
530E2:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.98	Depth to water	1.00
	Seepage	0.02				
530F:						
Ozaukee-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.28	Depth to saturated zone	0.68	Depth to water	1.00
	Seepage	0.02				
531B:						
Markham-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.86	Depth to water	1.00
531C2, 531D2:						
Markham-------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.95	Depth to water	1.00
557A:						
Millstream----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	1.00		
			Seepage	0.17		
570B, 570C2:						
Martinsville--------	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	1.00	Depth to water	1.00
			Seepage	0.01		

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
626A:						
Kish	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.70		
696A, 696B, 696C2, 696D2:						
Zurich	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.92	Cutbanks cave	1.00
			Depth to saturated zone	0.68	Depth to water	0.14
697A, 697B:						
Wauconda	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.75		
698A, 698B:						
Grays	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Depth to saturated zone	0.68	Cutbanks cave	1.00
					Depth to water	0.14
			Piping	0.46		
706B, 706C:						
Boyer	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.22	Depth to water	1.00
791A, 791B, 791C2:						
Rush	Very limited		Very limited		Very limited	
	Seepage	1.00	Piping	1.00	Depth to water	1.00
			Seepage	0.28		
792A, 792B:						
Bowes	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.86	Depth to water	1.00
			Seepage	0.17		
802B:						
Orthents, loamy	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.04	Piping	0.68	Depth to water	1.00
805B:						
Orthents, clayey	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.68	Depth to water	1.00
830:						
Landfills	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.86	Depth to water	1.00
Udipsamments, Aquic	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	0.86		

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
840B, 840C2:						
Zurich----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.92	Cutbanks cave	1.00
			Depth to saturated zone	0.68	Depth to water	0.14
Ozaukee---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.68	Depth to water	1.00
865:						
Pits, gravel----------	Not rated		Not rated		Not rated	
969E2:						
Casco-----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.31	Depth to water	1.00
	Slope	0.04				
Rodman----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.87	Depth to water	1.00
	Slope	0.04				
969F:						
Casco-----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.31	Depth to water	1.00
	Slope	0.28				
Rodman----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.87	Depth to water	1.00
	Slope	0.28				
978A, 978B:						
Wauconda--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.47		
Beecher---------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.02	Depth to saturated zone	1.00	Depth to water	1.00
			Piping	0.28		
979A, 979B:						
Grays-----------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Depth to saturated zone	0.68	Cutbanks cave	1.00
					Depth to water	0.14
			Piping	0.46		
Markham---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.86	Depth to water	1.00
981A, 981B:						
Wauconda--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.75		
Frankfort-------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
982A, 982B:						
Aptakisic-----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.99		
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
983B:						
Zurich--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.92	Cutbanks cave	1.00
			Depth to saturated zone	0.68	Depth to water	0.14
Nappanee------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
984B:						
Barrington----------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Piping	0.69	Cutbanks cave	1.00
			Depth to saturated zone	0.68	Depth to water	0.14
Varna---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.02	Depth to saturated zone	0.68	Depth to water	1.00
989A, 989B:						
Mundelein-----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	0.71		
Elliott-------------	Not limited		Very limited		Very limited	
			Depth to saturated zone	1.00	Depth to water	1.00
			Piping	0.41		
1082A:						
Millington----------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
					Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.76		
1103A:						
Houghton------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Content of organic matter	1.00		
			Ponding	1.00		
1107A:						
Sawmill-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
					Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.03		

Table 20a.--Water Management--Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
1210A:						
Lena----------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Content of organic matter	1.00		
			Ponding	1.00		
1330A:						
Peotone-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.04	Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to pack	0.13		
1529A:						
Selmass-------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Piping	1.00		
			Ponding	1.00		
			Seepage	0.11		
3107A:						
Sawmill-------------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
					Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.03		
4103A:						
Houghton------------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Content of organic matter	1.00		
			Ponding	1.00		
4777A:						
Adrian--------------	Very limited		Very limited		Very limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
8082A:						
Millington----------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
					Cutbanks cave	0.10
			Ponding	1.00		
			Piping	0.81		

Table 20b.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A, 23B:						
Blount	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
67A:						
Harpster	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Ponding	1.00		
103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Subsidence	1.00
134A, 134B:						
Camden	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
146A, 146B:						
Elliott	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.91	Restricted permeability	0.91		
153A, 153A+:						
Pella	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Ponding	1.00		
189A, 189B:						
Martinton	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.22	Restricted permeability	0.22		
192A, 192B:						
Del Rey	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
219A:						
Millbrook-----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
223B:						
Varna---------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.91		
223C2:						
Varna---------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00	Slope	0.16
	Depth to saturated zone	0.24	Restricted permeability	0.91		
228A, 228B, 228B2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
228C2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Droughty	1.00	Restricted permeability	0.99	Slope	0.16
	Restricted permeability	0.99				
232A:						
Ashkum--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.22	Ponding	1.00	Restricted permeability	0.22
			Restricted permeability	0.22		
298A, 298B:						
Beecher-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
318C2:						
Lorenzo-------------	Very limited		Very limited		Not limited	
	Droughty	1.00	Too sandy	1.00		
	Content of large stones	0.35	Content of large stones	0.35		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
320A, 320B, 320B2:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
323B:						
Casco---------------	Very limited		Very limited		Not limited	
	Droughty	1.00	Too sandy	1.00		
	Content of large stones	0.07	Content of large stones	0.07		
323C2:						
Casco---------------	Very limited		Very limited		Not limited	
	Droughty	1.00	Too sandy	1.00		
	Content of large stones	0.11	Content of large stones	0.11		
323D2, 323D3:						
Casco---------------	Very limited		Very limited		Not limited	
	Slope	1.00	Too sandy	1.00		
	Droughty	1.00	Slope	1.00		
	Content of large stones	0.16	Content of large stones	0.16		
325A, 325B:						
Dresden-------------	Not limited		Very limited		Not limited	
			Too sandy	1.00		
327A, 327B:						
Fox-----------------	Not limited		Very limited		Not limited	
			Too sandy	1.00		
327C2:						
Fox-----------------	Not limited		Very limited		Not limited	
			Too sandy	1.00		
327D2:						
Fox-----------------	Very limited		Very limited		Not limited	
	Slope	1.00	Too sandy	1.00		
			Slope	1.00		
330A:						
Peotone-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.22	Ponding	1.00	Restricted permeability	0.22
			Restricted permeability	0.22		
365A:						
Aptakisic-----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
367:						
Beach sand----------	Not rated		Not rated		Not rated	

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
370B:						
Saylesville	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
	Restricted permeability	0.22	Restricted permeability	0.22		
370C2:						
Saylesville	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Slope	0.16
	Restricted permeability	0.22	Restricted permeability	0.22		
442A, 442B:						
Mundelein	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
443A, 443B:						
Barrington	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
465A:						
Montgomery	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.91	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.91	Restricted permeability	0.91
488A:						
Hooppole	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
513A:						
Granby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Droughty	1.00	Ponding	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
523A:						
Dunham	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
			Ponding	1.00		
526A:						
Grundelein	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530B, 530B2:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.91		
530C, 530C2, 530C3:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00	Slope	0.16
	Depth to saturated zone	0.76	Restricted permeability	0.91		
530D, 530D2, 530D3:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.76	Restricted permeability	0.91		
530E, 530E2, 530F:						
Ozaukee-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.76	Restricted permeability	0.91		
531B:						
Markham-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.47	Restricted permeability	0.91		
531C2:						
Markham-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00	Slope	0.16
	Depth to saturated zone	0.68	Restricted permeability	0.91		
531D2:						
Markham-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.62	Restricted permeability	0.91		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
557A:						
Millstream----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
570B:						
Martinsville--------	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
570C2:						
Martinsville--------	Not limited		Not limited		Not limited	
626A:						
Kish----------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
696A, 696B:						
Zurich--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
696C2:						
Zurich--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00	Slope	0.16
696D2:						
Zurich--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Slope	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Depth to saturated zone	0.24	Slope	1.00	Slope	0.96
			Depth to saturated zone	1.00		
697A, 697B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
698A, 698B:						
Grays---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
706B:						
Boyer---------------	Not limited		Very limited		Not limited	
			Too sandy	1.00		
706C:						
Boyer---------------	Not limited		Very limited		Not limited	
			Too sandy	1.00		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
791A, 791B:						
Rush----------------	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
791C2:						
Rush----------------	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
792A, 792B:						
Bowes---------------	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
802B:						
Orthents, loamy-----	Very limited		Very limited		Not limited	
	Water erosion	1.00	Water erosion	1.00		
	Restricted permeability	0.22	Restricted permeability	0.22		
805B:						
Orthents, clayey----	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Droughty	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.99	Restricted permeability	0.99		
	Depth to saturated zone	0.24				
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Very limited		Very limited		Not limited	
	Droughty	1.00	Too sandy	1.00		
Udipsamments, Aquic	Very limited		Very limited		Very limited	
	Droughty	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
840B:						
Zurich--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.91		
840C2:						
Zurich--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00	Slope	0.16

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
840C2:						
Ozaukee-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00	Slope	0.16
	Depth to saturated zone	0.76	Restricted permeability	0.91		
865:						
Pits, gravel--------	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco---------------	Very limited		Very limited		Not limited	
	Slope	1.00	Slope	1.00		
	Droughty	1.00	Too sandy	1.00		
	Content of large stones	0.20	Content of large stones	0.20		
Rodman--------------	Very limited		Very limited		Not limited	
	Slope	1.00	Slope	1.00		
	Droughty	1.00	Too sandy	1.00		
978A:						
Wauconda------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
Beecher-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
978B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Beecher-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
979A, 979B:						
Grays---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
Markham-------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.47	Restricted permeability	0.91		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways: Rating class and limiting features	Value	Constructing terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
981A:						
Wauconda	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
Frankfort	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
981B:						
Wauconda	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Frankfort	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
982A, 982B:						
Aptakisic	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Too sandy	1.00		
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
983B:						
Zurich	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
Nappanee	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Restricted permeability	0.99		
984B:						
Barrington	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
984B:						
Varna	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.91		
989A, 989B:						
Mundelein	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Elliott	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Restricted permeability	0.91	Restricted permeability	0.91		
1082A:						
Millington	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Flooding	1.00
1103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Subsidence	1.00
1107A:						
Sawmill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Flooding	1.00
1210A:						
Lena	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
					Subsidence	1.00
1330A:						
Peotone	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Frost action	1.00
	Restricted permeability	0.22	Ponding	1.00	Restricted permeability	0.22
			Restricted permeability	0.22		
1529A:						
Selmass	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00

Table 20b.--Water Management--Continued

Map symbol and soil name	Constructing grassed waterways		Constructing terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3107A:						
Sawmill	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Flooding	1.00
4103A:						
Houghton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Subsidence	1.00
4777A:						
Adrian	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Cutbanks cave	1.00
			Too sandy	1.00	Subsidence	1.00
8082A:						
Millington	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Flooding	1.00

Table 20c.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23A:						
Blount	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.23				
23B:						
Blount	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.01				
	Slope	0.01				
67A:						
Harpster	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
103A:						
Houghton	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Soil blowing	1.00		
134A:						
Camden	Not limited		Not limited		Not limited	
134B:						
Camden	Somewhat limited		Very limited		Not limited	
	Too acid	0.08	Water erosion	1.00		
	Slope	0.03				
146A:						
Elliott	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.44				
146B:						
Elliott	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Slope	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods): Rating class and limiting features	Value	Sprinkler irrigation: Rating class and limiting features	Value	Drip or trickle irrigation: Rating class and limiting features	Value
153A, 153A+:						
Pella	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.04				
189A:						
Martinton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96				
	Too acid	0.01				
189B:						
Martinton	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96				
	Slope	0.01				
192A:						
Del Rey	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
192B:						
Del Rey	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Slope	0.01				
219A:						
Millbrook	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.68				
223B:						
Varna	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.68				
	Slope	0.01				
223C2:						
Varna	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.68				
	Slope	0.33				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
228A:						
Nappanee------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.48		
228B:						
Nappanee------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.47		
	Slope	0.01				
228B2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.57		
	Slope	0.01				
228C2:						
Nappanee------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	1.00		
	Slope	0.33				
	Limited available water	0.14				
232A:						
Ashkum--------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96				
298A:						
Beecher-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
298B:						
Beecher-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.08				
	Slope	0.01				
318C2:						
Lorenzo-------------	Somewhat limited		Very limited		Not limited	
	Limited available water	0.72	Limited available water	1.00		
	Slope	0.33				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
320A:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.31		
	Limited available water	0.01				
320B, 320B2:						
Frankfort-----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.82		
	Limited available water	0.23				
	Slope	0.01				
323B:						
Casco---------------	Somewhat limited		Very limited		Not limited	
	Limited available water	0.47	Limited available water	1.00		
	Slope	0.01				
	Too acid	0.01				
323C2:						
Casco---------------	Somewhat limited		Very limited		Not limited	
	Limited available water	0.61	Limited available water	1.00		
	Slope	0.33				
	Too acid	0.01				
323D2, 323D3:						
Casco---------------	Very limited		Very limited		Not limited	
	Slope	1.00	Limited available water	1.00		
	Limited available water	0.76	Slope	0.22		
	Too acid	0.01				
325A:						
Dresden-------------	Somewhat limited		Not limited		Not limited	
	Too acid	0.01				
325B:						
Dresden-------------	Somewhat limited		Not limited		Not limited	
	Too acid	0.01				
	Slope	0.01				
327A:						
Fox-----------------	Somewhat limited		Not limited		Not limited	
	Too acid	0.08				
327B:						
Fox-----------------	Somewhat limited		Somewhat limited		Not limited	
	Too acid	0.01	Limited available water	0.14		
	Slope	0.01				
327C2:						
Fox-----------------	Somewhat limited		Not limited		Not limited	
	Slope	0.33				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
327D2:						
Fox-----------------	Very limited		Somewhat limited		Not limited	
	Slope	1.00	Limited available water	0.42		
			Slope	0.22		
330A:						
Peotone-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96				
365A:						
Aptakisic-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
367:						
Beach sand----------	Not rated		Not rated		Not rated	
370B:						
Saylesville---------	Somewhat limited		Not limited		Not limited	
	Restricted permeability	0.96				
	Depth to saturated zone	0.68				
	Slope	0.01				
370C2:						
Saylesville---------	Somewhat limited		Not limited		Not limited	
	Restricted permeability	0.96				
	Depth to saturated zone	0.68				
	Slope	0.33				
442A:						
Mundelein-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
442B:						
Mundelein-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01				
	Slope	0.01				
443A:						
Barrington----------	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
	Too acid	0.01				
443B:						
Barrington----------	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
	Slope	0.01				
	Too acid	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods): Rating class and limiting features	Value	Sprinkler irrigation: Rating class and limiting features	Value	Drip or trickle irrigation: Rating class and limiting features	Value
465A:						
Montgomery----------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
488A:						
Hooppole------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
513A:						
Granby--------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Limited available water	1.00		
523A:						
Dunham--------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
526A:						
Grundelein----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01				
530B, 530B2:						
Ozaukee-------------	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.68				
	Slope	0.01				
530C, 530C2:						
Ozaukee-------------	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.98				
	Slope	0.33				
530C3:						
Ozaukee-------------	Very limited		Very limited		Not limited	
	Restricted permeability	1.00	Water erosion	1.00		
	Depth to saturated zone	0.75	Limited available water	0.16		
	Slope	0.33				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530D:						
Ozaukee	Very limited		Somewhat limited		Not limited	
	Restricted permeability	1.00	Slope	0.22		
	Slope	1.00				
	Depth to saturated zone	0.98				
	Too acid	0.15				
530D2:						
Ozaukee	Very limited		Somewhat limited		Not limited	
	Restricted permeability	1.00	Slope	0.22		
			Limited available water	0.17		
	Slope	1.00				
	Depth to saturated zone	0.98				
	Too acid	0.15				
530D3:						
Ozaukee	Very limited		Very limited		Not limited	
	Restricted permeability	1.00	Water erosion	1.00		
			Slope	0.22		
	Slope	1.00	Limited available water	0.04		
	Depth to saturated zone	1.00				
530E:						
Ozaukee	Very limited		Very limited		Not limited	
	Restricted permeability	1.00	Slope	1.00		
			Limited available water	0.22		
	Slope	1.00				
	Depth to saturated zone	0.98				
	Too acid	0.15				
530E2:						
Ozaukee	Very limited		Very limited		Not limited	
	Restricted permeability	1.00	Slope	1.00		
			Limited available water	0.05		
	Slope	1.00				
	Depth to saturated zone	0.98				
530F:						
Ozaukee	Very limited		Very limited		Not limited	
	Restricted permeability	1.00	Slope	1.00		
	Slope	1.00				
	Depth to saturated zone	0.68				
531B:						
Markham	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.86				
	Too acid	0.44				
	Slope	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
531C2:						
Markham-------------	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.95				
	Slope	0.33				
	Too acid	0.01				
531D2:						
Markham-------------	Very limited		Somewhat limited		Not limited	
	Restricted permeability	1.00	Slope	0.22		
	Slope	1.00				
	Depth to saturated zone	0.93				
	Too acid	0.01				
557A:						
Millstream----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.08				
570B:						
Martinsville--------	Somewhat limited		Not limited		Not limited	
	Too acid	0.08				
	Slope	0.01				
570C2:						
Martinsville--------	Somewhat limited		Not limited		Not limited	
	Slope	0.33				
626A:						
Kish----------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
696A:						
Zurich--------------	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
696B:						
Zurich--------------	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Slope	0.01				
696C2:						
Zurich--------------	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Slope	0.33				
696D2:						
Zurich--------------	Very limited		Very limited		Not limited	
	Slope	1.00	Water erosion	1.00		
	Depth to saturated zone	0.68	Slope	0.22		

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
697A:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
697B:						
Wauconda------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.01	Water erosion	1.00		
698A:						
Grays---------------	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
	Too acid	0.08				
698B:						
Grays---------------	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Too acid	0.08				
	Slope	0.01				
706B:						
Boyer---------------	Somewhat limited		Somewhat limited		Not limited	
	Limited available water	0.03	Limited available water	0.74		
	Slope	0.01				
	Too acid	0.01				
706C:						
Boyer---------------	Somewhat limited		Somewhat limited		Not limited	
	Slope	0.33	Limited available water	0.81		
	Limited available water	0.08				
	Too acid	0.01				
791A:						
Rush----------------	Somewhat limited		Not limited		Not limited	
	Too acid	0.08				
791B:						
Rush----------------	Somewhat limited		Very limited		Not limited	
	Too acid	0.08	Water erosion	1.00		
	Slope	0.01				
791C2:						
Rush----------------	Somewhat limited		Very limited		Not limited	
	Slope	0.33	Water erosion	1.00		
	Too acid	0.08				
792A:						
Bowes---------------	Somewhat limited		Not limited		Not limited	
	Too acid	0.68				
792B:						
Bowes---------------	Somewhat limited		Very limited		Not limited	
	Too acid	0.68	Water erosion	1.00		
	Slope	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
802B:						
Orthents, loamy-----	Somewhat limited		Very limited		Not limited	
	Restricted	0.96	Water erosion	1.00		
	Slope	0.03				
805B:						
Orthents, clayey----	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.68	Limited available water	1.00		
	Limited available water	0.50	Water erosion	1.00		
	Slope	0.01				
830:						
Landfills-----------	Not rated		Not rated		Not rated	
839B:						
Udipsamments, Typic	Somewhat limited		Very limited		Not limited	
	Limited available water	0.99	Too sandy	1.00		
			Soil blowing	1.00		
	Too acid	0.08	Limited available water	1.00		
	Slope	0.03				
Udipsamments, Aquic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Too sandy	1.00	Depth to saturated zone	1.00
			Soil blowing	1.00		
	Limited available water	0.98	Limited available water	1.00		
	Too acid	0.15	Depth to saturated zone	1.00		
840B:						
Zurich--------------	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Slope	0.01				
Ozaukee-------------	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.68				
	Slope	0.01				
840C2:						
Zurich--------------	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Slope	0.33				
Ozaukee-------------	Very limited		Somewhat limited		Not limited	
	Restricted permeability	1.00	Limited available water	0.17		
	Depth to saturated zone	0.98				
	Slope	0.33				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
865:						
Pits, gravel	Not rated		Not rated		Not rated	
969E2, 969F:						
Casco	Very limited		Very limited		Not limited	
	Slope	1.00	Slope	1.00		
	Limited available water	0.85	Limited available water	1.00		
	Too acid	0.01				
Rodman	Very limited		Very limited		Not limited	
	Slope	1.00	Limited available water	1.00		
	Limited available water	1.00	Slope	1.00		
978A:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Beecher	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
978B:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.01	Water erosion	1.00		
Beecher	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.08				
	Slope	0.01				
979A:						
Grays	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
	Too acid	0.08				
Markham	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.86				
	Too acid	0.44				
979B:						
Grays	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Too acid	0.08				
	Slope	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
979B:						
Markham	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.86				
	Too acid	0.44				
	Slope	0.01				
981A:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Frankfort	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.31		
	Limited available water	0.01				
981B:						
Wauconda	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.01	Water erosion	1.00		
Frankfort	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.27		
	Slope	0.01				
982A:						
Aptakisic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.48		
982B:						
Aptakisic	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.01	Water erosion	1.00		
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.47		
	Slope	0.01				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
983B:						
Zurich	Somewhat limited		Very limited		Not limited	
	Depth to saturated zone	0.68	Water erosion	1.00		
	Slope	0.01				
Nappanee	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Limited available water	0.47		
	Slope	0.01				
984B:						
Barrington	Somewhat limited		Not limited		Not limited	
	Depth to saturated zone	0.68				
	Slope	0.01				
	Too acid	0.01				
Varna	Very limited		Not limited		Not limited	
	Restricted permeability	1.00				
	Depth to saturated zone	0.68				
	Slope	0.01				
989A:						
Mundelein	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Elliott	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Too acid	0.44				
989B:						
Mundelein	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.01				
	Slope	0.01				
Elliott	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00				
	Slope	0.01				
1082A:						
Millington	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	0.60				

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods) Rating class and limiting features	Value	Sprinkler irrigation Rating class and limiting features	Value	Drip or trickle irrigation Rating class and limiting features	Value
1103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Soil blowing	1.00		
1107A:						
Sawmill-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frequent flooding	0.80	Flooding	1.00	Flooding	1.00
	Too acid	0.01				
1210A:						
Lena----------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
			Soil blowing	1.00		
1330A:						
Peotone-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96				
1529A:						
Selmass-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3107A:						
Sawmill-------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	0.80	Flooding	1.00	Flooding	1.00
	Too acid	0.01				
4103A:						
Houghton------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Soil blowing	1.00		
4777A:						
Adrian--------------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.96	Soil blowing	1.00		

Table 20c.--Water Management--Continued

Map symbol and soil name	Irrigation (all application methods)		Sprinkler irrigation		Drip or trickle irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8082A:						
Millington----------	Very limited		Very limited		Very limited	
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	0.60				

Table 21.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
23A:												
Blount----------	0-7	Silt loam	CL, ML	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	7-13	Silt loam	CL, ML	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	13-26	Silty clay loam, silty clay, clay loam	CL, ML, CH, MH	A-6, A-7-6, A-7-5	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	26-32	Silty clay loam, clay loam, silty clay	CH, CL, ML, MH	A-6, A-7-6, A-7-5	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	32-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6, A-7-5	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
23B:												
Blount----------	0-6	Silt loam	CL, ML	A-4, A-6	0	0-5	95-100	95-100	90-100	80-95	25-40	8-20
	6-10	Silt loam	CL, ML	A-6, A-4	0	0-5	95-100	95-100	90-100	80-95	20-35	8-18
	10-23	Silty clay loam, silty clay, clay loam	CL, ML, CH, MH	A-7-5, A-7-6, A-6	0-1	0-5	95-100	85-98	70-97	65-95	35-60	15-35
	23-34	Silty clay loam, clay loam, silty clay	CL, ML, CH, MH	A-7-5, A-7-6, A-6	0-1	0-5	95-100	80-95	65-93	60-90	35-55	10-30
	34-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6, A-7-5	0-1	0-10	90-100	80-93	65-92	60-90	30-50	10-25
67A:												
Harpster--------	0-18	Silty clay loam	CL, ML	A-7-6, A-7-5	0	0	100	97-100	95-100	85-100	40-46	15-19
	18-41	Silty clay loam	CL, ML	A-7-6, A-6	0	0	100	97-100	95-100	85-100	37-46	17-24
	41-56	Silt loam	ML, CL	A-6, A-4	0	0	100	97-100	95-100	85-100	24-37	7-18
	56-60	Loam, silt loam	SC, SC-SM, ML, CL, CL-ML	A-6, A-4	0	0	100	95-100	70-90	45-70	22-33	4-14
103A:												
Houghton--------	0-11	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	11-60	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
134A:												
Camden----------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	9-14	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	14-29	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	29-60	Clay loam, loam, sandy loam	CL, SC, ML, CL-ML, SM	A-2-4, A-4, A-6	0	0-1	90-100	85-100	60-95	30-85	20-40	5-15
	60-71	Stratified silt loam to loamy sand	SM, SC, SC-SM, ML	A-2-4, A-4	0	0-3	85-100	80-98	50-90	15-75	5-25	NP-10
134B:												
Camden----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	7-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-15
	10-33	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	25-40	15-25
	33-52	Clay loam, loam, sandy loam	CL, SC, ML, CL-ML, SM	A-2-4, A-4, A-6	0	0-1	90-100	85-100	60-95	30-85	20-40	5-15
	52-60	Stratified silt loam to loamy sand	SM, SC, SC-SM, ML	A-2-4, A-4	0	0-3	85-100	80-98	50-90	15-75	5-25	NP-10
146A:												
Elliott---------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	6-11	Silty clay loam	ML, CL	A-7-5, A-7-6	0	0	100	100	95-100	85-100	40-46	15-19
	11-16	Silty clay	CL, CH, MH	A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	42-56	18-30
	16-41	Silty clay loam	ML, CL	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	41-60	Silty clay loam	ML, CL	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17
146B:												
Elliott---------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	9-13	Silty clay loam	CL, ML	A-7-5, A-7-6	0	0	100	100	95-100	85-100	40-46	15-19
	13-17	Silty clay loam, silty clay	MH, CL, CH	A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	40-52	15-28
	17-35	Silty clay loam	ML, CL	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	35-60	Silty clay loam	CL, ML	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
153A:												
Pella-----------	0-12	Silty clay loam	CL, ML	A-7-6, A-7-5	0	0	100	95-100	90-100	85-100	40-50	15-25
	12-33	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	95-100	90-100	85-100	30-50	15-30
	33-42	Silty clay loam, silt loam, sandy loam	CL, SC, ML, SM	A-6, A-7-6	0-1	0-5	95-100	85-100	85-95	40-90	25-45	10-25
	42-60	Stratified loamy sand to silty clay loam	SM, SC, ML, CL	A-2-6, A-4, A-6, A-2-4	0-1	0-5	90-100	80-100	50-100	15-85	20-35	7-20
153A+:												
Pella-----------	0-16	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0-2	95-100	95-100	90-100	85-98	25-40	6-17
	16-30	Silty clay loam	CL, ML	A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	40-50	15-25
	30-53	Silty clay loam	ML, CL	A-6, A-7-6	0	0	100	95-100	90-100	85-100	30-50	15-30
	53-62	Silty clay loam, silt loam, sandy loam	CL, SC, ML, SM	A-6, A-7-6	0-1	0-5	95-100	85-100	85-95	40-90	25-45	10-25
	62-80	Stratified loamy sand to silty clay loam	SM, SC, ML, CL	A-2-6, A-4, A-6, A-2-4	0-1	0-5	90-100	80-100	50-100	15-85	20-35	7-20
189A:												
Martinton-------	0-12	Silt loam	CL, ML	A-6, A-7-6	0	0	95-100	95-100	90-100	75-95	30-45	10-20
	12-39	Silty clay loam, silty clay	CL	A-6, A-7-6	0	0	95-100	95-100	90-100	70-95	35-50	20-30
	39-60	Stratified sandy loam to silty clay	CL, SC, ML, SM	A-6, A-7-6	0	0	90-100	80-100	75-100	35-90	25-45	10-25
189B:												
Martinton-------	0-10	Silt loam	CL, ML	A-6, A-7-6	0	0	95-100	95-100	90-100	75-95	30-45	10-20
	10-34	Silty clay loam, silty clay	CL	A-6, A-7-6	0	0	95-100	95-100	90-100	70-95	35-50	20-30
	34-60	Stratified sandy loam to silty clay	CL, SC, ML, SM	A-6, A-7-6	0	0	90-100	80-100	75-100	35-90	25-45	10-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
192A:												
Del Rey---------	0-4	Silt loam	ML, CL	A-6	0	0	95-100	95-100	90-100	75-98	25-45	10-25
	4-9	Silt loam	ML, CL	A-6	0	0	95-100	95-100	90-100	75-98	20-40	8-20
	9-33	Silty clay loam, silty clay	CL, CH	A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	40-55	20-30
	33-41	Silty clay loam, silty clay	ML, CL	A-6, A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	35-50	15-30
	41-60	Silt loam, silty clay loam	ML, CL	A-6, A-7-6	0	0	95-100	95-100	90-100	75-98	30-45	10-25
192B:												
Del Rey---------	0-5	Silt loam	CL, ML	A-6	0	0	95-100	95-100	90-100	75-98	25-45	10-25
	5-8	Silt loam	ML, CL	A-6	0	0	95-100	95-100	90-100	75-98	20-40	8-20
	8-22	Silty clay loam, silty clay	CL, CH	A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	40-55	20-30
	22-34	Silty clay loam, silty clay	ML, CL	A-6, A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	35-50	15-30
	34-60	Silt loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	95-100	95-100	90-100	75-98	30-45	10-25
219A:												
Millbrook-------	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	8-12	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	12-26	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	100	95-100	85-100	30-45	10-25
	26-41	Clay loam, loam, sandy loam	SC, CL, ML, SM	A-6, A-7-6	0	0-3	95-100	85-100	70-95	40-85	25-50	10-25
	41-65	Stratified loamy sand to clay loam	SM, CL, SC, CL-ML	A-2-4, A-2-6, A-4, A-6	0-1	0-5	90-100	80-100	65-90	15-80	5-30	NP-15

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
223B:												
Varna-----------	0-12	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	80-95	25-40	8-20
	12-30	Silty clay, silty clay loam, clay	CL, CH, MH	A-6, A-7-6	0-1	0-3	95-100	90-100	85-100	80-95	35-55	20-35
	30-48	Silty clay, silty clay loam	CL, ML	A-6, A-7-6	0-1	0-5	95-100	85-100	80-100	75-95	30-50	15-30
	48-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6	0-1	0-5	90-100	85-100	80-100	70-95	30-45	13-25
223C2:												
Varna-----------	0-9	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	80-95	25-40	8-20
	9-29	Silty clay, silty clay loam, clay	CL, CH, MH	A-6, A-7-6	0-1	0-3	95-100	90-100	85-100	80-95	35-55	20-35
	29-50	Silty clay, silty clay loam	CL, ML	A-6, A-7-6	0-1	0-5	95-100	85-100	80-100	75-95	30-50	15-30
	50-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6	0-1	0-5	90-100	85-100	80-100	70-95	30-45	13-25
228A:												
Nappanee--------	0-5	Silt loam	CL, ML	A-4, A-6	0	0-1	95-100	95-100	90-100	80-95	25-40	8-20
	5-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	90-100	80-95	20-35	5-18
	8-26	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	26-48	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	48-75	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
228B:												
Nappanee--------	0-4	Silt loam	CL, ML	A-4, A-6	0	0-1	95-100	95-100	90-100	80-95	25-40	8-20
	4-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	90-100	80-95	20-35	5-18
	9-23	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	23-46	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	46-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
228B2:												
Nappanee--------	0-5	Silty clay loam	CL, ML	A-6, A-7-6	0	0-1	95-100	95-100	90-100	80-95	30-45	10-30
	5-10	Silty clay loam	CL, ML	A-6, A-7-6	0	0-1	95-100	95-100	90-100	80-95	30-45	10-30
	10-22	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	22-50	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	50-70	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
228C2:												
Nappanee--------	0-5	Silty clay loam	CL, ML	A-6, A-7-6	0	0-1	95-100	95-100	90-100	80-95	30-45	10-30
	5-8	Silty clay loam	CL, ML	A-6, A-7-6	0	0-1	95-100	95-100	90-100	80-95	30-45	10-30
	8-23	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	23-27	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	27-80	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
232A:												
Ashkum----------	0-12	Silty clay loam	MH, CH, CL	A-7-6	0	0	100	100	95-100	85-100	45-52	22-28
	12-29	Silty clay loam, silty clay	CH, MH, CL	A-7-6, A-7-5	0	0	100	97-100	95-100	85-100	45-57	22-32
	29-54	Silty clay loam	ML, CL	A-6	0	0-1	95-100	85-98	80-95	70-95	33-45	12-22
	54-60	Silty clay loam	ML, CL	A-6	0	0-3	95-100	85-98	80-95	70-95	33-39	12-17
298A:												
Beecher---------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	9-21	Silty clay loam, silty clay	CL, CH, MH	A-6, A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	35-55	15-30
	21-37	Silty clay loam	CL, ML	A-6, A-7-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	37-60	Silty clay loam	ML, CL	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17
298B:												
Beecher---------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	7-24	Silty clay loam, silty clay	MH, CH, CL	A-6, A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	35-55	15-30
	24-36	Silty clay loam	ML, CL	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	36-60	Silty clay loam	ML, CL	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
318C2:												
Lorenzo---------	0-8	Loam	CL, ML	A-6	0	0-5	95-100	90-100	75-90	60-75	25-40	10-20
	8-15	Loam, clay loam, gravelly sandy clay loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0	2-10	85-100	50-95	35-85	20-70	30-45	10-25
	15-60	Stratified gravelly loamy sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a	0	5-20	25-80	10-70	5-40	1-15	0-15	NP-5
320A:												
Frankfort-------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	98-100	95-100	90-100	80-95	25-40	8-20
	9-14	Silty clay loam	CL, ML	A-6, A-7-6	0	0	98-100	95-100	90-100	80-95	25-45	10-25
	14-24	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	24-34	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	34-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
320B:												
Frankfort-------	0-8	Silt loam	CL, ML	A-4, A-6	0	0	98-100	95-100	90-100	80-95	25-40	8-20
	8-12	Silty clay loam	CL, ML	A-6, A-7-6	0	0	98-100	95-100	90-100	80-95	25-45	10-25
	12-32	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	32-37	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	37-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
320B2:												
Frankfort-------	0-6	Silty clay loam	CL, ML	A-6, A-7-6	0	0	98-100	95-100	90-100	80-95	25-45	10-25
	6-21	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	21-35	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	35-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
323B:												
Casco-----------	0-6	Loam	CL, CL-ML, ML	A-4	0	0-5	90-100	85-100	70-95	50-80	20-30	3-10
	6-20	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	20-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
323C2:												
Casco-----------	0-6	Loam	CL, CL-ML, ML	A-4	0	0-5	90-100	85-100	70-95	50-80	20-30	3-10
	6-18	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	18-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
323D2:												
Casco-----------	0-5	Loam	CL, CL-ML, ML	A-4	0	0-5	90-100	85-100	70-95	50-80	20-30	3-10
	5-16	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	16-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
323D3:												
Casco-----------	0-6	Clay loam	CL, ML	A-6	0	0-2	85-100	80-100	65-90	50-80	30-40	10-20
	6-12	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	12-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
325A:												
Dresden---------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	70-98	20-40	5-15
	9-29	Silty clay loam, clay loam, loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	80-100	70-100	50-95	30-45	10-25
	29-33	Clay loam, gravelly clay loam, sandy clay loam, very gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	60-100	40-100	35-90	30-70	25-45	10-25
	33-60	Stratified gravelly loamy sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-5	5-35	45-90	15-70	10-50	1-20	0-14	NP
325B:												
Dresden---------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	70-98	20-40	5-15
	7-27	Silty clay loam, clay loam, loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	80-100	70-100	50-95	30-45	10-25
	27-32	Clay loam, gravelly clay loam, sandy clay loam, very gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	60-100	40-100	35-90	30-70	25-45	10-25
	32-60	Stratified gravelly loamy sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-5	5-35	45-90	15-70	10-50	1-20	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
327A:												
Fox-------------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-98	70-95	15-30	3-15
	10-21	Silty clay loam, silt loam	ML, CL	A-6, A-7-6	0	0-1	95-100	85-100	75-100	70-95	25-50	10-25
	21-33	Clay loam, sandy clay loam, gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	35-95	30-80	25-45	10-25
	33-60	Stratified gravelly sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP
327B:												
Fox-------------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-98	70-95	15-30	3-15
	7-11	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0-1	95-100	85-100	75-100	70-95	25-50	10-25
	11-32	Clay loam, sandy clay loam, gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	35-95	30-80	25-45	10-25
	32-60	Stratified gravelly sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP
327C2:												
Fox-------------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	85-98	70-95	15-30	3-15
	9-21	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0-1	95-100	85-100	75-100	70-95	25-50	10-25
	21-34	Clay loam, sandy clay loam, gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	35-95	30-80	25-45	10-25
	34-60	Stratified gravelly sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
327D2:												
Fox	0-8	Loam	CL, CL-ML, ML	A-6, A-4	0	0	95-100	95-100	85-98	60-80	15-30	3-15
	8-28	Clay loam, sandy clay loam, gravelly loam	CL, ML, SC, SM	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	35-95	30-80	25-45	10-25
	28-60	Stratified gravelly sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-10	30-100	15-85	10-70	2-10	0-14	NP
330A:												
Peotone	0-13	Silty clay loam	CL, CH, MH	A-7-6, A-7-5	0	0	100	95-100	95-100	90-100	40-65	15-35
	13-50	Silty clay loam, silty clay	CL, CH, MH	A-7-6, A-7-5	0	0-3	98-100	95-100	90-100	85-100	40-70	15-40
	50-60	Silty clay loam, silt loam, silty clay	CL, CH, MH	A-6, A-7-6, A-7-5	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30
365A:												
Aptakisic	0-3	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	3-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	8-24	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	30-45	10-25
	24-33	Clay loam, silt loam, sandy loam	CL, SC, ML, SM	A-6, A-4	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	33-80	Stratified loamy sand to clay loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
367.												
Beach sand												

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
370B:												
Saylesville-----	0-9	Silt loam	CL, ML	A-6	0	0	95-100	95-100	90-100	75-98	25-45	10-25
	9-21	Silty clay loam, silty clay	CL, CH	A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	40-55	20-30
	21-34	Silty clay loam, silty clay	CL, ML	A-7-6, A-7-5, A-6	0	0	95-100	95-100	90-100	85-98	35-50	15-30
	34-60	Silt loam, silty clay loam	ML, CL	A-6, A-7-6	0	0	95-100	95-100	90-100	75-98	30-45	10-25
370C2:												
Saylesville-----	0-7	Silt loam	CL, ML	A-6	0	0	95-100	95-100	90-100	75-98	25-45	10-25
	7-28	Silty clay loam, silty clay	CL, CH	A-7-6, A-7-5	0	0	95-100	95-100	90-100	85-98	40-55	20-30
	28-38	Silty clay loam, silty clay	CL, ML	A-6, A-7-5, A-7-6	0	0	95-100	95-100	90-100	85-98	35-50	15-30
	38-60	Silt loam, silty clay loam	ML, CL	A-7-6, A-6	0	0	95-100	95-100	90-100	75-98	30-45	10-25
442A:												
Mundelein-------	0-17	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7-6	0	0	100	98-100	95-100	85-100	25-45	5-20
	17-31	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	35-50	15-25
	31-42	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	42-60	Stratified fine sand to silt loam	CL, ML, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	0	90-100	80-100	60-90	20-85	5-35	NP-20

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
442B:												
Mundelein-------	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7-6	0	0	100	98-100	95-100	85-100	25-45	5-20
	12-30	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	35-50	15-25
	30-37	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	37-60	Stratified fine sand to silt loam	CL, ML, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	0	90-100	80-100	60-90	20-85	5-35	NP-20
443A:												
Barrington------	0-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	90-100	85-100	25-40	5-20
	13-28	Silty clay loam, silt loam	CL, ML	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	28-44	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	44-66	Stratified fine sand to silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	80-100	60-90	20-85	10-30	5-15
443B:												
Barrington------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	90-100	85-100	25-40	5-20
	11-32	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	32-42	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	42-60	Stratified fine sand to silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	80-100	60-90	20-85	10-30	5-15
465A:												
Montgomery------	0-18	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-100	40-50	20-30
	18-40	Silty clay	CH	A-7-5, A-7-6	0	0	100	100	95-100	90-100	50-65	30-42
	40-48	Silty clay loam, silty clay	CL, CH	A-7-6, A-7-5	0	0	100	100	95-100	90-100	45-60	25-40
	48-60	Silty clay loam, silty clay	CH, CL, MH, ML	A-6, A-7-5, A-7-6	0	0	100	100	90-100	85-100	35-55	15-35

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
488A:												
Hooppole--------	0-17	Loam	CL, ML	A-4, A-6	0	0	100	95-100	80-100	55-75	25-35	7-17
	17-44	Clay loam, loam, silt loam	CL, ML	A-6, A-7-5, A-7-6	0	0	95-100	90-100	85-95	60-80	30-45	10-20
	44-60	Loamy sand, sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	80-100	30-75	5-25	0-10	NP
513A:												
Granby----------	0-8	Fine sandy loam	SM, SC-SM	A-2-4, A-4	0	0	100	100	60-70	25-45	5-20	NP-5
	8-17	Sand, loamy sand, loamy fine sand	SP-SM, SM	A-2-4, A-3	0	0	100	95-100	50-75	5-25	0-15	NP-3
	17-30	Sand, fine sand, loamy fine sand	SP-SM, SM	A-3, A-2-4	0	0	100	95-100	50-75	5-25	0-15	NP-3
	30-80	Sand, fine sand, loamy sand	SP-SM, SP	A-2-4, A-3	0	0	100	90-100	50-70	0-20	0-14	NP
523A:												
Dunham----------	0-12	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	30-50	15-30
	12-35	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-95	35-45	15-25
	35-44	Clay loam, silt loam, sandy loam, gravelly loam	ML, CL, SC	A-2-6, A-4, A-6	0	0-5	90-100	70-100	55-90	30-80	25-40	8-20
	44-60	Stratified gravelly sandy loam to extremely gravelly coarse sand	GM, GP-GM, SM, SP-SM	A-1-b, A-1-a	0-3	0-10	35-90	15-80	10-40	2-25	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
526A:												
Grundelein------	0-11	Silt loam	ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	30-40	8-15
	11-33	Silty clay loam, silt loam	ML, CL	A-6, A-7-6	0	0	100	98-100	90-100	80-100	35-50	10-25
	33-39	Clay loam, sandy loam, silt loam, gravelly loam	ML, SC, CL	A-2-4, A-4, A-6, A-2-6	0	0-5	90-100	70-100	55-90	30-80	25-40	8-20
	39-60	Stratified gravelly sandy loam to extremely gravelly coarse sand	GM, GP-GM, SM, SP-SM	A-1-a, A-1-b	0-3	0-10	40-90	15-80	10-50	2-25	0-14	NP
530B:												
Ozaukee---------	0-4	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-21	Silty clay loam, clay, silty clay	CL, MH, CH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	21-39	Silty clay loam, silty clay	CL, CH	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	39-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530B2:												
Ozaukee---------	0-4	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-22	Silty clay loam, silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	22-27	Silty clay loam, silty clay	CL, CH	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	27-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
530C:												
Ozaukee---------	0-5	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	5-10	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-33	Silty clay loam, clay, silty clay	CH, CL, MH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	33-38	Silty clay loam, silty clay	CL, CH	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	38-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530C2:												
Ozaukee---------	0-6	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-21	Silty clay loam, clay, silty clay	CL, CH, MH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	21-28	Silty clay loam, silty clay	CH, CL	A-6, A-7-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	28-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530C3:												
Ozaukee---------	0-7	Silty clay loam	CL, ML	A-6, A-7-6	0	0-2	95-98	90-98	85-95	85-95	35-50	15-25
	7-23	Silty clay loam, clay, silty clay	CH, CL, MH	A-7-5, A-7-6	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	23-34	Silty clay loam, silty clay	CL, CH	A-6, A-7-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	34-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
530D:												
Ozaukee---------	0-4	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-9	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	9-34	Silty clay loam, clay, silty clay	CH, CL, MH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	34-39	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	39-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530D2:												
Ozaukee---------	0-6	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-20	Silty clay loam, clay, silty clay	CL, CH, MH	A-7-5, A-7-6	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	20-28	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	28-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530D3:												
Ozaukee---------	0-9	Silty clay loam	CL, ML	A-7-6, A-6	0	0-2	95-98	90-98	85-95	85-95	35-50	15-25
	9-17	Silty clay loam, clay, silty clay	CH, MH, CL	A-7-5, A-7-6	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	17-37	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	37-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
530E:												
Ozaukee---------	0-4	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-8	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	8-20	Silty clay loam, clay, silty clay	CL, CH, MH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	20-25	Silty clay loam, silty clay	CH, CL	A-6, A-7-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	25-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530E2:												
Ozaukee---------	0-6	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-27	Silty clay loam, clay, silty clay	CL, CH, MH	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	27-31	Silty clay loam, silty clay	CH, CL	A-6, A-7-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	31-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
530F:												
Ozaukee---------	0-5	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	5-29	Silty clay loam, clay, silty clay	MH, CH, CL	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	29-36	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	36-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
531B:												
Markham---------	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	25-40	6-17
	8-21	Silty clay, silty clay loam	CH, CL	A-7-6, A-7-5	0-1	0-5	95-100	90-100	85-100	80-95	40-55	20-35
	21-32	Silty clay loam, silty clay	ML, CL	A-6, A-7-6	0-2	0-5	90-100	85-100	80-100	75-95	30-50	15-30
	32-60	Silty clay loam, clay loam	ML, CL	A-6, A-7-6	0-2	0-10	90-100	85-100	75-95	70-95	30-45	13-25
531C2:												
Markham---------	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	25-40	6-17
	8-20	Silty clay, silty clay loam	CH, CL	A-7-5, A-7-6	0-1	0-5	95-100	90-100	85-100	80-95	40-55	20-35
	20-29	Silty clay loam, silty clay	CL, ML	A-7-6, A-6	0-2	0-5	90-100	85-100	80-100	75-95	30-50	15-30
	29-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6	0-2	0-10	90-100	85-100	75-95	70-95	30-45	13-25
531D2:												
Markham---------	0-7	Silt loam	CL, ML, CL-ML	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	25-40	6-17
	7-20	Silty clay, silty clay loam	CH, CL	A-7-5, A-7-6	0-1	0-5	95-100	90-100	85-100	80-95	40-55	20-35
	20-30	Silty clay loam, silty clay	ML, CL	A-7-6, A-6	0-2	0-5	90-100	85-100	80-100	75-95	30-50	15-30
	30-60	Silty clay loam, clay loam	ML, CL	A-6, A-7-6	0-2	0-10	90-100	85-100	75-95	70-95	30-45	13-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
557A:												
Millstream------	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	8-14	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	14-27	Silty clay loam, silt loam	ML, CL	A-6, A-7-6	0	0	100	100	95-100	85-100	30-45	10-25
	27-47	Clay loam, gravelly loam, sandy loam	CL, SC, ML, CL-ML, SM	A-2-4, A-4, A-6	0	0-2	85-100	70-100	60-95	30-85	20-40	5-15
	47-60	Stratified gravelly loamy sand to extremely gravelly coarse sand	GM, GP-GM, SM, SP-SM	A-1-b, A-1-a	0-3	0-10	35-90	15-80	10-40	2-25	0-14	NP
570B:												
Martinsville----	0-5	Silt loam	CL, CL-ML, ML	A-4	0	0	100	90-100	75-100	65-90	15-25	3-8
	5-12	Sandy loam, loam	ML, CL-ML, CL	A-4	0	0	100	90-100	75-95	45-70	15-25	3-8
	12-38	Clay loam, silty clay loam, sandy clay loam, loam	CL, ML	A-4, A-6	0	0	95-100	85-100	70-95	45-90	25-40	7-15
	38-53	Sandy loam, sandy clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	40-80	20-30	5-15
	53-60	Stratified sand to silt loam	SM, SC-SM, ML, CL-ML	A-1-b, A-2-4, A-4	0	0	95-100	85-100	45-95	10-80	15-25	NP-8
570C2:												
Martinsville----	0-9	Silt loam	CL, CL-ML, ML	A-4	0	0	100	90-100	75-100	65-90	15-25	3-8
	9-29	Clay loam, silty clay loam, sandy clay loam, loam	CL, ML	A-4, A-6	0	0	95-100	85-100	70-95	45-90	25-40	7-15
	29-59	Sandy loam, sandy clay loam, silt loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	95-100	85-100	55-95	40-80	20-30	5-15
	59-70	Stratified sand to silt loam	SM, SC-SM, ML, CL-ML	A-1-b, A-2-4, A-4	0	0	95-100	85-100	45-95	10-80	15-25	NP-8

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
626A:												
Kish------------	0-11	Loam	CL, ML	A-4, A-6	0	0	100	95-100	80-100	55-80	25-35	7-17
	11-47	Loam, clay loam, sandy loam	CL, SC	A-6	0	0-1	95-100	90-100	75-95	45-85	24-36	11-19
	47-60	Stratified sandy loam to silt loam	CL, CL-ML, SC, SC-SM	A-2-6, A-4, A-6	0	0-2	90-100	80-98	60-90	30-70	15-35	5-20
696A:												
Zurich----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	5-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	10-29	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	29-36	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	36-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
696B:												
Zurich----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	5-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	9-28	Silty clay loam, silt loam	CL, ML	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	28-38	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-64	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
696C2:												
Zurich----------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	10-27	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	27-40	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	40-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
696D2:												
Zurich----------	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	6-25	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	25-35	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	35-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
697A:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-14	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	14-30	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	30-38	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
697B:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	33-39	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	39-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
698A:												
Grays-----------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	25-40	8-20
	9-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	20-35	5-15
	12-35	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	35-42	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	42-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
698B:												
Grays-----------	0-8	Silt loam	CL, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	25-40	8-20
	8-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	20-35	5-15
	11-34	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	34-42	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	42-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
706B:												
Boyer-----------	0-4	Sandy loam	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0-3	95-100	80-98	50-90	25-55	15-25	NP-7
	4-9	Sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0-3	95-100	80-98	50-90	20-55	12-25	NP-7
	9-31	Sandy loam, loam, gravelly sandy loam, loamy sand	SC, SC-SM, SM, SP-SM	A-2-4, A-4	0-1	0-5	80-100	55-98	55-85	10-50	18-30	2-12
	31-62	Stratified very gravelly coarse sand to loamy sand	SM, SP-SM, SP, GM	A-1-b, A-2-4, A-3	0-5	0-10	40-100	30-98	30-70	2-20	0-15	NP-3

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
706C:												
Boyer-----------	0-5	Sandy loam	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0-3	95-100	80-98	50-90	25-55	15-25	NP-7
	5-10	Sandy loam, loamy sand	SC-SM, SM, CL-ML, ML	A-2-4, A-4	0	0-3	95-100	80-98	50-90	20-55	12-25	NP-7
	10-29	Sandy loam, loam, gravelly sandy loam, loamy sand	SC, SC-SM, SM, SP-SM	A-2-4, A-4	0-1	0-5	80-100	55-98	55-85	10-50	18-30	2-12
	29-60	Stratified very gravelly coarse sand to loamy sand	SM, SP-SM, SP, GM	A-1-b, A-2-4, A-3	0-5	0-10	40-100	30-98	30-70	2-20	0-15	NP-3
791A:												
Rush------------	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-30	5-15
	4-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-30	5-15
	11-38	Silty clay loam, silt loam	CL	A-6	0	0	100	100	90-100	85-100	30-40	10-20
	38-45	Clay loam, loam, gravelly sandy loam	CL, SC	A-2-6, A-6	0	1-5	80-100	50-100	40-90	25-75	30-40	10-20
	45-60	Stratified extremely gravelly coarse sand to gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-1	1-5	30-85	15-75	10-40	2-15	0-14	NP
791B:												
Rush------------	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-30	5-15
	7-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-30	5-15
	11-35	Silty clay loam, silt loam	CL	A-6	0	0	100	100	90-100	85-100	30-40	10-20
	35-46	Clay loam, loam, gravelly sandy loam	CL, SC	A-2-6, A-6	0	1-5	80-100	50-100	40-90	25-75	30-40	10-20
	46-60	Stratified extremely gravelly coarse sand to gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-1	1-5	30-85	15-75	10-40	2-15	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
791C2:												
Rush------------	0-7	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	20-30	5-15
	7-37	Silty clay loam, silt loam	CL	A-6	0	0	100	100	90-100	85-100	30-40	10-20
	37-48	Clay loam, loam, gravelly sandy loam	CL, SC	A-2-6, A-6	0	1-5	80-100	50-100	40-90	25-75	30-40	10-20
	48-60	Stratified extremely gravelly coarse sand to gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-1	1-5	30-85	15-75	10-40	2-15	0-14	NP
792A:												
Bowes-----------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-20
	9-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-30	5-15
	13-43	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	98-100	95-100	90-100	90-100	35-45	15-25
	43-51	Gravelly clay loam, gravelly sandy loam, very gravelly loamy sand	CL, SM, CL-ML, SC	A-2-4, A-4, A-6	0-2	0-20	45-90	30-80	25-75	15-70	10-30	NP-15
	51-61	Stratified extremely gravelly coarse sand to gravelly sandy loam	GM, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-2	5-35	30-85	15-80	10-50	2-20	0-20	NP-3

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
792B:												
Bowes-----------	0-7	Silt loam	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-20
	7-37	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	98-100	95-100	90-100	90-100	35-45	15-25
	37-43	Gravelly clay loam, gravelly sandy loam, very gravelly loamy sand	CL, SM, CL-ML, SC	A-2-4, A-4, A-6	0-2	0-20	45-90	30-80	25-75	15-70	10-30	NP-15
	43-60	Stratified extremely gravelly coarse sand to gravelly sandy loam	GM, GP-GM, SP, SP-SM	A-1-a, A-1-b	0-2	5-35	30-85	15-80	10-50	2-20	0-20	NP-3
802B:												
Orthents, loamy	0-6	Loam	ML, CL	A-4, A-6	0-1	0-5	95-100	85-100	80-95	50-80	20-40	8-20
	6-60	Loam, silt loam, clay loam	CL, ML	A-6, A-4	0-1	0-5	95-100	80-100	75-95	50-80	20-40	8-20
805B:												
Orthents, clayey	0-6	Silty clay	CL, CH, MH	A-7-6	0	0	98-100	90-100	85-100	80-98	45-55	20-40
	6-60	Silty clay, clay, silty clay loam	CH, CL	A-7-6	0	0	98-100	85-100	80-98	75-95	40-55	25-45
830.												
Landfills												
839B:												
Udipsamments, Typic----------	0-4	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	98-100	90-100	40-85	3-20	0-14	NP
	4-12	Sand, fine sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	90-100	40-80	1-15	0-12	NP
	12-60	Sand, fine sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0-2	90-100	80-100	40-80	1-15	0-12	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
839B:												
Udipsamments, Aquic----------	0-7	Sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	98-100	90-100	40-85	3-20	0-14	NP
	7-20	Sand, fine sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	95-100	90-100	40-80	1-15	0-12	NP
	20-60	Sand, fine sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0-2	90-100	80-100	40-80	1-15	0-12	NP
840B:												
Zurich----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	5-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	9-28	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	28-38	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-64	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
Ozaukee---------	0-4	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	4-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	10-21	Silty clay loam, clay, silty clay	MH, CL, CH	A-7-5, A-7-6	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	21-39	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	39-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
840C2:												
Zurich----------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	11-27	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	27-40	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	40-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
840C2:												
Ozaukee---------	0-6	Silt loam	ML, CL	A-4, A-6	0	0-1	98-100	98-100	90-100	85-95	25-35	7-15
	6-21	Silty clay loam, clay, silty clay	CH, MH, CL	A-7-6, A-7-5	0-1	0-3	95-100	90-98	85-95	85-95	45-65	25-40
	21-28	Silty clay loam, silty clay	CH, CL	A-7-6, A-6	0-1	0-5	90-98	85-98	80-95	75-95	35-55	20-35
	28-60	Silty clay loam, clay loam	CL	A-6, A-7-6	0-1	0-5	90-98	80-95	75-95	70-90	35-45	15-25
865. Pits, gravel												
969E2:												
Casco-----------	0-5	Loam	CL, CL-ML, ML	A-4	0	0-5	90-100	85-100	70-95	50-80	20-30	3-10
	5-19	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	19-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
Rodman----------	0-6	Gravelly loam	CL-ML, ML, SC-SM, SC	A-4	0	0-2	75-95	65-80	60-75	35-65	0-30	3-9
	6-10	Gravelly loam, sandy loam, loam	CL-ML, SM, ML, SC, SC-SM	A-1-b, A-2-4, A-4	0	0-2	70-95	50-80	40-75	20-55	0-30	NP-10
	10-60	Stratified very gravelly loamy sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a	0-1	1-5	30-70	15-50	7-20	2-15	0-14	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
969F:												
Casco-----------	0-4	Loam	CL, CL-ML, ML	A-4	0	0-5	90-100	85-100	70-95	50-80	20-30	3-10
	4-15	Clay loam, sandy clay loam, gravelly loam	CL, ML, GC, SC	A-2-6, A-6, A-7-6	0-1	0-5	65-100	50-100	40-90	30-80	25-46	11-26
	15-60	Stratified sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a, A-1-b, A-3	0-3	0-30	25-100	15-85	10-75	2-10	0-14	NP
Rodman----------	0-11	Gravelly loam	CL-ML, ML, SC-SM, SC	A-4	0	0-2	75-95	65-80	60-75	35-65	0-30	3-9
	11-14	Gravelly loam, sandy loam, loam	CL-ML, SM, ML, SC, SC-SM	A-1-b, A-2-4, A-4	0	0-2	70-95	50-80	40-75	20-55	0-30	NP-10
	14-60	Stratified very gravelly loamy sand to extremely gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1-a	0-1	1-5	30-70	15-50	7-20	2-15	0-14	NP
978A:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-14	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	14-30	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	30-38	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Beecher---------	0-9	Silt loam	ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	9-21	Silty clay loam, silty clay	CL, MH, CH	A-6, A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	35-55	15-30
	21-37	Silty clay loam	ML, CL	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	37-60	Silty clay loam	CL, ML	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
978B:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	33-39	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	39-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Beecher---------	0-7	Silt loam	ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	7-24	Silty clay loam, silty clay	CH, CL, MH	A-6, A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	35-55	15-30
	24-36	Silty clay loam	ML, CL	A-6, A-7-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	36-60	Silty clay loam	CL, ML	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17
979A:												
Grays-----------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	25-40	8-20
	9-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	20-35	5-15
	12-35	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	35-42	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	42-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Markham---------	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	25-40	6-17
	8-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	20-35	5-15
	11-24	Silty clay, silty clay loam	CH, CL	A-7-5, A-7-6	0-1	0-5	95-100	90-100	85-100	80-95	40-55	20-35
	24-37	Silty clay loam, silty clay	ML, CL	A-6, A-7-6	0-2	0-5	90-100	85-100	80-100	75-95	30-50	15-30
	37-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6	0-2	0-10	90-100	85-100	75-95	70-95	30-45	13-25

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
979B:												
Grays-----------	0-8	Silt loam	CL, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	25-40	8-20
	8-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	95-100	85-100	20-35	5-15
	11-34	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	34-42	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	42-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Markham---------	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0-1	0-2	95-100	95-100	90-100	85-95	25-40	6-17
	8-21	Silty clay, silty clay loam	CH, CL	A-7-5, A-7-6	0-1	0-5	95-100	90-100	85-100	80-95	40-55	20-35
	21-32	Silty clay loam, silty clay	ML, CL	A-7-6, A-6	0-2	0-5	90-100	85-100	80-100	75-95	30-50	15-30
	32-60	Silty clay loam, clay loam	ML, CL	A-6, A-7-6	0-2	0-10	90-100	85-100	75-95	70-95	30-45	13-25
981A:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-14	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	14-30	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	30-38	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Frankfort-------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	98-100	95-100	90-100	80-95	25-40	8-20
	9-14	Silty clay loam	CL, ML	A-6, A-7-6	0	0	98-100	95-100	90-100	80-95	25-45	10-25
	14-24	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	24-34	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	34-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
981B:												
Wauconda--------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	8-20
	9-33	Silty clay loam, silt loam	CL	A-6, A-7-6	0	0	100	98-100	90-100	85-100	30-45	15-30
	33-39	Silt loam, sandy loam, loam	CL, ML, SC, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	39-60	Stratified loamy sand to silt loam	SC, CL, SC-SM, CL-ML	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	2-30	NP-15
Frankfort-------	0-8	Silt loam	CL, ML	A-4, A-6	0	0	98-100	95-100	90-100	80-95	25-40	8-20
	8-12	Silty clay loam	CL, ML	A-6, A-7-6	0	0	98-100	95-100	90-100	80-95	25-45	10-25
	12-32	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	32-37	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	37-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
982A:												
Aptakisic-------	0-3	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	3-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	8-24	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	30-45	10-25
	24-33	Clay loam, silt loam, sandy loam	CL, SC, ML, SM	A-6, A-4	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	33-80	Stratified loamy sand to clay loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
Nappanee--------	0-5	Silt loam	CL, ML	A-6, A-4	0	0-1	95-100	95-100	90-100	80-95	25-40	8-20
	5-8	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0-1	95-100	95-100	90-100	80-95	20-35	5-18
	8-26	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	26-48	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	48-75	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
982B:												
Aptakisic-------	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	6-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	10-29	Silty clay loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	30-45	10-25
	29-35	Clay loam, silt loam, sandy loam	CL, SC, ML, SM	A-6, A-4	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	35-60	Stratified loamy sand to clay loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
Nappanee--------	0-4	Silt loam	CL, ML	A-6, A-4	0	0-1	95-100	95-100	90-100	80-95	25-40	8-20
	4-9	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0-1	95-100	95-100	90-100	80-95	20-35	5-18
	9-23	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	23-46	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	46-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30
983B:												
Zurich----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	5-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-100	20-35	5-15
	9-28	Silty clay loam, silt loam	ML, CL	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	28-38	Silt loam, sandy loam, loam	CL, SC, ML, SM	A-4, A-6	0	0	95-100	90-100	70-95	40-90	25-40	8-20
	38-64	Stratified loamy sand to silt loam	SC, CL, SC-SM, SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	65-90	15-85	5-30	NP-15
Nappanee--------	0-4	Silt loam	CL, ML	A-6, A-4	0	0-1	95-100	95-100	90-100	80-95	25-40	8-20
	4-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	95-100	95-100	90-100	80-95	20-35	5-18
	9-23	Silty clay, clay	CL, CH, MH	A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	80-95	40-70	20-40
	23-46	Silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0	0-2	95-100	90-100	85-100	75-95	30-50	15-30
	46-60	Silty clay loam, silty clay, clay	CL, ML	A-6, A-7-5, A-7-6	0-1	0-3	95-100	85-100	80-100	70-95	30-50	10-30

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
984B:												
Barrington------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	98-100	90-100	85-100	25-40	5-20
	11-32	Silty clay loam, silt loam	CL, ML	A-6, A-7-5, A-7-6	0	0	100	98-100	90-100	85-100	35-50	11-25
	32-42	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	42-60	Stratified fine sand to silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	80-100	60-90	20-85	10-30	5-15
Varna-----------	0-12	Silt loam	CL, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	80-95	25-40	8-20
	12-30	Silty clay, silty clay loam, clay	CL, CH, MH	A-6, A-7-6	0-1	0-3	95-100	90-100	85-100	80-95	35-55	20-35
	30-48	Silty clay, silty clay loam	CL, ML	A-6, A-7-6	0-1	0-5	95-100	85-100	80-100	75-95	30-50	15-30
	48-60	Silty clay loam, clay loam	CL, ML	A-6, A-7-6	0-1	0-5	90-100	85-100	80-100	70-95	30-45	13-25
989A:												
Mundelein-------	0-17	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7-6	0	0	100	98-100	95-100	85-100	25-45	5-20
	17-31	Silty clay loam, silt loam	CL, ML	A-6, A-7-6	0	0	100	98-100	95-100	85-100	35-50	15-25
	31-42	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	42-60	Stratified fine sand to silt loam	CL, ML, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	0	90-100	80-100	60-90	20-85	5-35	NP-20
Elliott---------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	6-11	Silty clay loam	CL, ML	A-7-5, A-7-6	0	0	100	100	95-100	85-100	40-46	15-19
	11-16	Silty clay	CH, MH, CL	A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	42-56	18-30
	16-41	Silty clay loam	CL, ML	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	41-60	Silty clay loam	CL, ML	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
989B:												
Mundelein-------	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6, A-7-6	0	0	100	98-100	95-100	85-100	25-45	5-20
	12-30	Silty clay loam, silt loam	ML, CL	A-6, A-7-6	0	0	100	98-100	95-100	85-100	35-50	15-25
	30-37	Sandy loam, silt loam, clay loam	CL, ML, SC, SM	A-4, A-6, A-7-6	0	0	95-100	85-100	70-95	45-90	20-45	8-20
	37-60	Stratified fine sand to silt loam	CL, ML, SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0	0	90-100	80-100	60-90	20-85	5-35	NP-20
Elliott---------	0-9	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	29-37	7-15
	9-13	Silty clay loam	CL, ML	A-7-5, A-7-6	0	0	100	100	95-100	85-100	40-46	15-19
	13-17	Silty clay loam, silty clay	MH, CH, CL	A-7-5, A-7-6	0	0	100	95-100	90-100	85-100	40-52	15-28
	17-35	Silty clay loam	ML, CL	A-7-6, A-6	0	0-1	95-100	85-98	80-95	70-95	33-42	12-20
	35-60	Silty clay loam	ML, CL	A-6	0	0-3	95-100	85-98	80-95	70-95	31-37	10-17
1082A:												
Millington------	0-21	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-100	70-95	25-35	5-20
	21-37	Loam, silt loam, clay loam	ML, CL	A-6, A-7-6	0	0	95-100	80-100	75-100	65-90	28-50	10-22
	37-60	Stratified sandy loam to silty clay loam	CL, ML	A-4, A-7-6, A-6	0	0	90-100	80-100	60-95	40-85	20-45	5-20
1103A:												
Houghton--------	0-7	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	7-60	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
1107A:												
Sawmill---------	0-28	Silty clay loam	CL, ML	A-7-6	0	0	100	97-100	95-100	85-100	40-46	16-21
	28-42	Silty clay loam	CL, ML	A-7-6, A-6	0	0	100	97-100	85-100	80-95	37-46	16-22
	42-60	Silty clay loam, clay loam, silt loam	CL, ML	A-7-6, A-6	0	0	100	90-100	85-100	80-95	37-46	16-22

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1210A:												
Lena------------	0-11	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	11-60	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
1330A:												
Peotone---------	0-22	Silty clay loam	CL, CH, MH	A-7-6, A-7-5	0	0	100	95-100	95-100	90-100	40-65	15-35
	22-43	Silty clay loam, silty clay	CL, CH, MH	A-7-6, A-7-5	0	0-3	98-100	95-100	90-100	85-100	40-70	15-40
	43-60	Silty clay loam, silt loam, silty clay	CL, CH, MH	A-6, A-7-6, A-7-5	0	0-5	95-100	95-100	90-100	75-100	30-60	15-30
1529A:												
Selmass---------	0-23	Loam	CL	A-4, A-6	0	0	100	98-100	80-100	55-80	25-35	7-17
	23-36	Clay loam, loam	CL, ML	A-6, A-7-6	0	0	100	95-100	80-95	50-85	30-45	10-20
	36-50	Loam, sandy loam, loamy sand	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0	95-100	85-100	60-90	20-70	15-30	3-15
	50-60	Loamy sand, sand	SM, SP-SM, SP	A-1-a, A-1-b, A-3	0	0-3	90-100	80-100	15-60	3-20	0-10	NP
3107A:												
Sawmill---------	0-29	Silty clay loam	CL, ML	A-7-6	0	0	100	97-100	95-100	85-100	40-46	16-21
	29-48	Silty clay loam	CL, ML	A-7-6, A-6	0	0	100	97-100	85-100	80-95	37-46	16-22
	48-60	Silty clay loam, clay loam, silt loam	CL, ML	A-7-6, A-6	0	0	100	90-100	85-100	80-95	37-46	16-22
4103A:												
Houghton--------	0-9	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	9-60	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
4777A:												
Adrian----------	0-13	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	13-26	Muck	PT	A-8	0	0	---	---	---	---	0-0	NP
	26-60	Fine sand, sand, gravelly sand, loamy sand	SM, SP-SM, SP	A-1-b, A-2-4, A-3	0	0	85-100	70-100	35-75	0-30	0-10	NP

Table 21.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
8082A:												
Millington------	0-26	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	95-100	90-100	80-100	70-95	25-35	5-20
	26-36	Loam, silt loam, clay loam	CL, ML	A-6, A-7-6	0	0	95-100	80-100	75-100	65-90	28-50	10-22
	36-62	Stratified sandy loam to silty clay loam	CL, ML	A-4, A-7-6, A-6	0	0	90-100	80-100	60-95	40-85	20-45	5-20

Table 22.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
23A:												
Blount	0-7	18-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	4	6	48
	7-13	15-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	13-26	35-48	1.40-1.70	0.06-0.6	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37			
	26-32	27-45	1.50-1.70	0.06-0.2	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37			
	32-60	27-40	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
23B:												
Blount	0-6	18-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.32	.32	4	6	48
	6-10	15-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	10-23	35-48	1.40-1.70	0.06-0.6	0.12-0.19	3.0-5.9	0.2-1.0	.37	.37			
	23-34	27-45	1.50-1.70	0.06-0.2	0.12-0.19	3.0-5.9	0.0-0.5	.37	.37			
	34-60	27-40	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
67A:												
Harpster	0-18	27-35	1.20-1.40	0.6-2	0.19-0.22	3.0-5.9	3.5-6.0	.24	.24	5	4L	86
	18-41	27-35	1.35-1.55	0.6-2	0.18-0.21	3.0-5.9	0.5-1.5	.37	.37			
	41-56	15-27	1.40-1.60	0.6-2	0.19-0.26	0.0-2.9	0.0-0.5	.49	.49			
	56-60	15-27	1.45-1.65	0.6-2	0.10-0.20	0.0-2.9	0.0-0.5	.32	.32			
103A:												
Houghton	0-11	---	0.20-0.35	0.2-6	0.35-0.45	---	70-99	---	---	3	2	134
	11-60	---	0.15-0.25	0.2-6	0.35-0.45	---	70-99	---	---			
134A:												
Camden	0-9	14-27	1.25-1.45	0.6-2	0.21-0.25	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-14	14-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	0.5-1.0	.49	.49			
	14-29	22-35	1.35-1.55	0.6-2	0.14-0.24	3.0-5.9	0.2-1.0	.37	.37			
	29-60	18-30	1.45-1.65	0.6-2	0.12-0.19	3.0-5.9	0.0-0.5	.32	.32			
	60-71	5-20	1.55-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.28	.28			
134B:												
Camden	0-7	14-27	1.25-1.45	0.6-2	0.21-0.25	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	7-10	14-27	1.30-1.50	0.6-2	0.20-0.24	0.0-2.9	0.5-1.0	.49	.49			
	10-33	22-35	1.35-1.55	0.6-2	0.14-0.24	3.0-5.9	0.2-1.0	.37	.37			
	33-52	18-30	1.45-1.65	0.6-2	0.12-0.19	3.0-5.9	0.0-0.5	.32	.32			
	52-60	5-20	1.55-1.70	0.6-6	0.07-0.17	0.0-2.9	0.0-0.5	.28	.28			
146A:												
Elliott	0-6	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	3.5-5.0	.24	.24	4	6	48
	6-11	27-35	1.20-1.40	0.6-2	0.19-0.22	3.0-5.9	2.5-4.0	.20	.20			
	11-16	40-50	1.40-1.60	0.06-0.6	0.10-0.13	6.0-8.9	0.5-1.5	.32	.32			
	16-41	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	41-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
146B:												
Elliott	0-9	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	3.5-5.0	.24	.24	4	6	48
	9-13	27-35	1.20-1.40	0.6-2	0.19-0.22	3.0-5.9	2.5-4.0	.20	.20			
	13-17	38-45	1.40-1.60	0.06-0.6	0.11-0.14	6.0-8.9	0.5-1.5	.32	.32			
	17-35	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	35-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
153A:												
Pella	0-12	27-35	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	4.0-6.0	.24	.24	5	6	48
	12-33	27-35	1.20-1.45	0.6-2	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37			
	33-42	15-30	1.35-1.60	0.6-2	0.15-0.20	3.0-5.9	0.2-0.5	.32	.32			
	42-60	10-30	1.40-1.70	0.6-6	0.10-0.22	0.0-2.9	0.0-0.2	.28	.28			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
153A+:												
Pella---------------	0-16	18-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	16-30	27-35	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	4.0-6.0	.24	.24			
	30-53	27-35	1.20-1.45	0.6-2	0.21-0.24	3.0-5.9	0.5-2.0	.37	.37			
	53-62	15-30	1.35-1.60	0.6-2	0.15-0.20	3.0-5.9	0.2-0.5	.32	.32			
	62-80	10-30	1.40-1.70	0.6-6	0.10-0.22	0.0-2.9	0.0-0.2	.28	.28			
189A:												
Martinton-----------	0-12	20-27	1.20-1.40	0.6-2	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48
	12-39	35-45	1.25-1.45	0.2-0.6	0.11-0.20	3.0-5.9	0.5-2.0	.37	.37			
	39-60	15-42	1.40-1.60	0.2-0.6	0.11-0.22	3.0-5.9	0.0-0.5	.37	.37			
189B:												
Martinton-----------	0-10	20-27	1.20-1.40	0.6-2	0.22-0.24	0.0-2.9	4.0-5.0	.24	.24	5	6	48
	10-34	35-45	1.25-1.45	0.2-0.6	0.11-0.20	3.0-5.9	0.5-2.0	.37	.37			
	34-60	15-42	1.40-1.60	0.2-0.6	0.11-0.22	3.0-5.9	0.0-0.5	.37	.37			
192A:												
Del Rey-------------	0-4	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-9	15-25	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-33	35-45	1.40-1.65	0.06-0.2	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37			
	33-41	30-42	1.45-1.65	0.06-0.2	0.11-0.19	3.0-5.9	0.0-0.5	.37	.37			
	41-60	22-33	1.50-1.70	0.06-0.2	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43			
192B:												
Del Rey-------------	0-5	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	5-8	15-25	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	8-22	35-45	1.40-1.65	0.06-0.2	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37			
	22-34	30-42	1.45-1.65	0.06-0.2	0.11-0.19	3.0-5.9	0.0-0.5	.37	.37			
	34-60	22-33	1.50-1.70	0.06-0.2	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43			
219A:												
Millbrook-----------	0-8	18-27	1.40-1.60	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	8-12	15-27	1.40-1.60	0.6-2	0.22-0.24	0.0-2.9	0.5-1.0	.43	.43			
	12-26	25-35	1.45-1.65	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37			
	26-41	18-32	1.45-1.70	0.6-2	0.12-0.19	3.0-5.9	0.0-0.5	.32	.32			
	41-65	10-30	1.50-1.75	0.6-6	0.11-0.19	0.0-2.9	0.0-0.5	.28	.28			
223B:												
Varna---------------	0-12	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.5-4.0	.24	.24	4	6	48
	12-30	35-50	1.40-1.60	0.06-0.6	0.10-0.19	3.0-5.9	0.5-1.5	.37	.37			
	30-48	30-45	1.50-1.70	0.06-0.2	0.10-0.19	3.0-5.9	0.2-1.0	.37	.37			
	48-60	27-40	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
223C2:												
Varna---------------	0-9	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.24	.24	4	6	48
	9-29	35-50	1.40-1.60	0.06-0.6	0.10-0.19	3.0-5.9	0.5-1.5	.37	.37			
	29-50	30-45	1.50-1.70	0.06-0.2	0.10-0.19	3.0-5.9	0.2-1.0	.37	.37			
	50-60	27-40	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
228A:												
Nappanee------------	0-5	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	5-8	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	8-26	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	26-48	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	48-75	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
228B:												
Nappanee------------	0-4	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-9	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-23	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	23-46	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	46-60	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
228B2:												
Nappanee------------	0-5	27-38	1.30-1.50	0.6-2	0.18-0.22	3.0-5.9	1.0-2.5	.28	.28	4	6	48
	5-10	27-35	1.30-1.50	0.6-2	0.16-0.21	3.0-5.9	0.2-1.0	.37	.37			
	10-22	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	22-50	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	50-70	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
228C2:												
Nappanee------------	0-5	27-38	1.30-1.50	0.6-2	0.18-0.22	3.0-5.9	1.0-2.5	.28	.28	4	6	48
	5-8	27-35	1.30-1.50	0.6-2	0.16-0.21	3.0-5.9	0.2-1.0	.37	.37			
	8-23	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	23-27	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	27-80	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
232A:												
Ashkum--------------	0-12	35-40	1.20-1.45	0.2-0.6	0.18-0.21	6.0-8.9	3.0-7.0	.20	.20	5	4	86
	12-29	35-45	1.30-1.50	0.2-0.6	0.15-0.18	6.0-8.9	0.5-2.5	.32	.32			
	29-54	30-40	1.50-1.70	0.2-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	54-60	27-35	1.55-1.75	0.2-0.6	0.07-0.15	3.0-5.9	0.0-0.5	.43	.43			
298A:												
Beecher-------------	0-9	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	9-21	35-50	1.40-1.60	0.06-0.6	0.11-0.15	3.0-5.9	0.2-1.0	.37	.37			
	21-37	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	37-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
298B:												
Beecher-------------	0-7	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	7-24	35-50	1.40-1.60	0.06-0.6	0.11-0.15	3.0-5.9	0.2-1.0	.37	.37			
	24-36	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	36-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
318C2:												
Lorenzo-------------	0-8	18-27	1.25-1.40	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.24	.24	3	6	48
	8-15	20-35	1.60-1.70	2-6	0.10-0.19	3.0-5.9	0.0-1.0	.28	.32			
	15-60	1-5	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
320A:												
Frankfort-----------	0-9	20-27	1.25-1.45	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	9-14	27-32	1.30-1.50	0.6-2	0.19-0.22	0.0-2.9	0.5-2.0	.37	.37			
	14-24	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	24-34	40-55	1.60-1.75	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	34-60	35-50	1.65-1.85	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
320B:												
Frankfort-----------	0-8	20-27	1.25-1.45	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	8-12	27-32	1.30-1.50	0.6-2	0.19-0.22	0.0-2.9	0.5-2.0	.37	.37			
	12-32	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	32-37	40-55	1.60-1.75	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	37-60	35-50	1.65-1.85	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
320B2:												
Frankfort-----------	0-6	27-35	1.30-1.50	0.6-2	0.19-0.22	3.0-5.9	2.0-3.0	.24	.24	4	6	48
	6-21	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	21-35	40-55	1.60-1.75	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	35-60	35-50	1.65-1.85	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
323B:												
Casco---------------	0-6	12-25	1.35-1.55	0.6-2	0.19-0.24	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	6-20	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	20-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
323C2:												
Casco---------------	0-6	12-25	1.35-1.55	0.6-2	0.19-0.24	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	6-18	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	18-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
323D2:												
Casco---------------	0-5	12-25	1.35-1.55	0.6-2	0.19-0.24	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	5-16	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	16-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
323D3:												
Casco---------------	0-6	27-33	1.40-1.55	0.6-2	0.15-0.20	3.0-5.9	0.5-1.0	.32	.32	2	6	48
	6-12	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	12-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
325A:												
Dresden-------------	0-9	18-27	1.25-1.40	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	9-29	25-35	1.35-1.55	0.6-2	0.15-0.20	3.0-5.9	0.2-1.0	.32	.32			
	29-33	20-30	1.45-1.70	0.6-2	0.08-0.18	3.0-5.9	0.0-0.5	.28	.32			
	33-60	1-5	1.60-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
325B:												
Dresden-------------	0-7	18-27	1.25-1.40	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	7-27	25-35	1.35-1.55	0.6-2	0.15-0.20	3.0-5.9	0.2-1.0	.32	.32			
	27-32	20-30	1.45-1.70	0.6-2	0.08-0.18	3.0-5.9	0.0-0.5	.28	.32			
	32-60	1-5	1.60-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
327A:												
Fox-----------------	0-10	15-25	1.30-1.50	0.6-2	0.17-0.24	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	10-21	18-35	1.50-1.65	0.6-2	0.10-0.22	3.0-5.9	0.2-0.5	.32	.32			
	21-33	18-35	1.55-1.65	0.6-2	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32			
	33-60	0-2	1.45-1.70	20-100	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05			
327B:												
Fox-----------------	0-7	15-25	1.30-1.50	0.6-2	0.17-0.24	0.0-2.9	1.0-3.0	.32	.32	4	5	56
	7-11	18-35	1.50-1.65	0.6-2	0.10-0.22	3.0-5.9	0.2-0.5	.32	.32			
	11-32	18-35	1.55-1.65	0.6-2	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32			
	32-60	0-2	1.45-1.70	20-100	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05			
327C2:												
Fox-----------------	0-9	15-25	1.30-1.50	0.6-2	0.17-0.24	0.0-2.9	1.0-2.0	.32	.32	4	5	56
	9-21	18-35	1.50-1.65	0.6-2	0.10-0.22	3.0-5.9	0.2-0.5	.32	.32			
	21-34	18-35	1.55-1.65	0.6-2	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32			
	34-60	0-2	1.45-1.70	20-100	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05			
327D2:												
Fox-----------------	0-8	15-25	1.35-1.55	0.6-2	0.15-0.22	0.0-2.9	1.0-2.0	.32	.32	4	5	56
	8-28	18-35	1.55-1.65	0.6-2	0.10-0.19	3.0-5.9	0.0-0.5	.28	.32			
	28-60	0-2	1.45-1.70	20-100	0.02-0.07	0.0-2.9	0.0-0.5	.02	.05			
330A:												
Peotone-------------	0-13	33-40	1.20-1.40	0.2-0.6	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86
	13-50	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37			
	50-60	25-42	1.40-1.65	0.2-0.6	0.10-0.20	6.0-8.9	0.2-0.5	.43	.43			
365A:												
Aptakisic-----------	0-3	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-8	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	8-24	27-35	1.40-1.60	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	24-33	10-30	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	33-80	5-30	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
367. Beach sand												
370B:												
Saylesville---------	0-9	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	9-21	35-45	1.40-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37			
	21-34	30-42	1.45-1.65	0.2-0.6	0.11-0.19	3.0-5.9	0.0-0.5	.37	.37			
	34-60	22-33	1.50-1.70	0.2-0.6	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43			
370C2:												
Saylesville---------	0-7	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	7-28	35-45	1.40-1.65	0.2-0.6	0.12-0.20	3.0-5.9	0.0-1.0	.37	.37			
	28-38	30-42	1.45-1.65	0.2-0.6	0.11-0.19	3.0-5.9	0.0-0.5	.37	.37			
	38-60	22-33	1.50-1.70	0.2-0.6	0.09-0.11	3.0-5.9	0.0-0.5	.43	.43			
442A:												
Mundelein-----------	0-17	20-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	17-31	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	31-42	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
442B:												
Mundelein-----------	0-12	20-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	12-30	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	30-37	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	37-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
443A:												
Barrington----------	0-13	20-27	1.20-1.40	0.6-2	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	13-28	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	28-44	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	44-66	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
443B:												
Barrington----------	0-11	20-27	1.20-1.40	0.6-2	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	11-32	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	32-42	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
465A:												
Montgomery----------	0-18	35-40	1.35-1.55	0.2-0.6	0.19-0.23	3.0-5.9	3.0-6.0	.20	.20	5	4	86
	18-40	40-55	1.45-1.65	0.06-0.2	0.11-0.14	6.0-8.9	0.5-2.0	.32	.32			
	40-48	35-50	1.45-1.65	0.06-0.2	0.11-0.18	6.0-8.9	0.0-1.0	.32	.32			
	48-60	32-48	1.50-1.60	0.06-0.2	0.10-0.20	3.0-5.9	0.0-0.5	.37	.37			
488A:												
Hooppole------------	0-17	20-27	1.40-1.60	0.6-2	0.20-0.24	0.0-2.9	4.0-7.0	.24	.24	4	4L	86
	17-44	22-35	1.35-1.50	0.6-2	0.15-0.19	3.0-5.9	0.5-2.0	.32	.32			
	44-60	2-12	1.65-1.80	6-20	0.05-0.10	0.0-2.9	0.0-0.5	.05	.05			
513A:												
Granby--------------	0-8	2-18	1.30-1.60	2-6	0.12-0.17	0.0-2.9	3.0-5.0	.17	.17	5	3	86
	8-17	0-14	1.35-1.55	6-20	0.07-0.12	0.0-2.9	0.5-2.0	.05	.05			
	17-30	0-14	1.45-1.65	6-20	0.06-0.11	0.0-2.9	0.2-1.5	.10	.10			
	30-80	0-10	1.50-1.70	6-20	0.05-0.10	0.0-2.9	0.0-0.5	.05	.05			
523A:												
Dunham--------------	0-12	27-35	1.10-1.30	0.6-2	0.21-0.23	3.0-5.9	4.0-6.0	.24	.24	4	6	48
	12-35	23-35	1.30-1.50	0.6-2	0.18-0.21	3.0-5.9	0.5-2.0	.37	.37			
	35-44	10-30	1.35-1.60	0.6-6	0.15-0.20	3.0-5.9	0.1-0.5	.32	.32			
	44-60	1-10	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
526A:												
Grundelein----------	0-11	18-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	4.0-5.0	.28	.28	4	6	48
	11-33	22-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	33-39	10-30	1.35-1.60	0.6-6	0.15-0.20	3.0-5.9	0.1-0.5	.32	.32			
	39-60	1-10	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
530B:												
Ozaukee-------------	0-4	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-10	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	10-21	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	21-39	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	39-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530B2:												
Ozaukee-------------	0-4	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	4-22	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	22-27	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	27-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530C:												
Ozaukee-------------	0-5	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	5-10	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	10-33	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	33-38	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	38-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530C2:												
Ozaukee-------------	0-6	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-21	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	21-28	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	28-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530C3:												
Ozaukee-------------	0-7	27-40	1.45-1.60	0.2-0.6	0.10-0.21	3.0-5.9	0.5-1.0	.37	.37	3	6	48
	7-23	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	23-34	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	34-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530D:												
Ozaukee-------------	0-4	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-9	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-34	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	34-39	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	39-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530D2:												
Ozaukee-------------	0-6	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-20	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	20-28	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	28-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530D3:												
Ozaukee-------------	0-9	27-40	1.45-1.60	0.2-0.6	0.10-0.21	3.0-5.9	0.5-1.0	.37	.37	3	6	48
	9-17	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	17-37	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	37-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530E:												
Ozaukee-------------	0-4	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-8	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	8-20	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	20-25	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	25-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
530E2:												
Ozaukee-------------	0-6	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-27	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	27-31	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	31-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
530F:												
Ozaukee-------------	0-5	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	5-29	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	29-36	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	36-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
531B:												
Markham-------------	0-8	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	8-21	35-50	1.40-1.60	0.06-0.6	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37			
	21-32	30-45	1.55-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	32-60	27-38	1.65-1.85	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
531C2:												
Markham-------------	0-8	20-27	1.10-1.40	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.28	.28	4	6	48
	8-20	35-50	1.40-1.60	0.06-0.6	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37			
	20-29	30-45	1.55-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	29-60	27-38	1.65-1.85	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
531D2:												
Markham-------------	0-7	20-27	1.10-1.40	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.28	.28	4	6	48
	7-20	35-50	1.40-1.60	0.06-0.6	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37			
	20-30	30-45	1.55-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	30-60	27-38	1.65-1.85	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
557A:												
Millstream----------	0-8	18-27	1.40-1.60	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	8-14	15-27	1.40-1.60	0.6-2	0.22-0.24	0.0-2.9	0.5-1.0	.43	.43			
	14-27	25-35	1.45-1.65	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.37	.37			
	27-47	10-30	1.45-1.65	0.6-2	0.12-0.18	3.0-5.9	0.0-0.5	.32	.32			
	47-60	1-10	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
570B:												
Martinsville--------	0-5	10-20	1.30-1.45	0.6-2	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	5-12	8-20	1.35-1.50	0.6-2	0.19-0.23	0.0-2.9	0.5-1.5	.37	.37			
	12-38	20-33	1.40-1.60	0.6-2	0.16-0.20	3.0-5.9	0.2-1.0	.32	.32			
	38-53	15-25	1.40-1.60	0.6-2	0.12-0.17	0.0-2.9	0.1-0.5	.28	.28			
	53-60	5-20	1.50-1.70	0.6-6	0.08-0.17	0.0-2.9	0.0-0.5	.24	.24			
570C2:												
Martinsville--------	0-9	10-20	1.30-1.45	0.6-2	0.20-0.24	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	9-29	20-33	1.40-1.60	0.6-2	0.16-0.20	3.0-5.9	0.2-1.0	.32	.32			
	29-59	15-25	1.40-1.60	0.6-2	0.12-0.17	0.0-2.9	0.1-0.5	.28	.28			
	59-70	5-20	1.50-1.70	0.6-6	0.08-0.17	0.0-2.9	0.0-0.5	.24	.24			
626A:												
Kish----------------	0-11	20-27	1.40-1.60	0.6-2	0.20-0.24	0.0-2.9	4.0-6.0	.24	.24	5	4L	86
	11-47	18-32	1.40-1.60	0.6-2	0.15-0.19	3.0-5.9	0.0-2.0	.32	.32			
	47-60	7-18	1.45-1.70	0.6-6	0.07-0.19	0.0-2.9	0.0-1.0	.32	.32			
696A:												
Zurich--------------	0-5	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-10	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	10-29	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	29-36	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	36-60	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
696B:												
Zurich--------------	0-5	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-9	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	9-28	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	28-38	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-64	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
696C2:												
Zurich--------------	0-10	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	10-27	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	27-40	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	40-60	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
696D2:												
Zurich--------------	0-6	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	6-25	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	25-35	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	35-60	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
697A:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-14	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	14-30	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	30-38	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
697B:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-33	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	33-39	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	39-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
698A:												
Grays---------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-12	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	12-35	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	35-42	8-25	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
698B:												
Grays---------------	0-8	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	8-11	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	11-34	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	34-42	8-25	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
706B:												
Boyer---------------	0-4	5-15	1.35-1.60	2-6	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	4-9	3-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.2-1.0	.28	.28			
	9-31	10-18	1.35-1.65	2-6	0.10-0.17	0.0-2.9	0.0-0.5	.24	.24			
	31-62	1-10	1.45-1.70	20-100	0.02-0.08	0.0-2.9	0.0-0.5	.02	.05			
706C:												
Boyer---------------	0-5	5-15	1.35-1.60	2-6	0.13-0.15	0.0-2.9	0.5-2.0	.20	.20	5	3	86
	5-10	3-15	1.35-1.60	2-6	0.10-0.14	0.0-2.9	0.2-1.0	.28	.28			
	10-29	10-18	1.35-1.65	2-6	0.10-0.17	0.0-2.9	0.0-0.5	.24	.24			
	29-60	1-10	1.45-1.70	20-100	0.02-0.08	0.0-2.9	0.0-0.5	.02	.05			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
791A:												
Rush----------------	0-4	12-27	1.20-1.35	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	4	5	56
	4-11	12-27	1.25-1.40	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	11-38	22-34	1.35-1.50	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	38-45	18-30	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.2-1.0	.28	.32			
	45-60	2-6	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
791B:												
Rush----------------	0-7	12-27	1.20-1.35	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	4	5	56
	7-11	12-27	1.25-1.40	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	11-35	22-34	1.35-1.50	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	35-46	18-30	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.2-1.0	.28	.32			
	46-60	2-6	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
791C2:												
Rush----------------	0-7	12-27	1.20-1.35	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	4	5	56
	7-37	22-34	1.35-1.50	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.37	.37			
	37-48	18-30	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.2-1.0	.28	.32			
	48-60	2-6	1.60-1.80	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
792A:												
Bowes---------------	0-9	18-27	1.30-1.50	0.6-2	0.22-0.25	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	9-13	15-25	1.35-1.55	0.6-2	0.21-0.24	0.0-2.9	0.5-1.5	.43	.43			
	13-43	25-35	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	43-51	10-32	1.55-1.75	0.6-6	0.10-0.16	3.0-5.9	0.1-0.5	.28	.32			
	51-61	2-10	1.60-1.80	20-100	0.02-0.08	0.0-2.9	0.0-0.5	.02	.05			
792B:												
Bowes---------------	0-7	18-27	1.30-1.50	0.6-2	0.22-0.25	0.0-2.9	2.0-4.0	.37	.37	4	6	48
	7-37	25-35	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	37-43	10-32	1.55-1.75	0.6-6	0.10-0.16	3.0-5.9	0.1-0.5	.28	.32			
	43-60	2-10	1.60-1.80	20-100	0.02-0.08	0.0-2.9	0.0-0.5	.02	.05			
802B:												
Orthents, loamy-----	0-6	22-27	1.70-1.75	0.2-0.6	0.18-0.22	0.0-2.9	0.5-2.0	.43	.43	5	6	48
	6-60	22-30	1.70-1.80	0.2-0.6	0.12-0.20	3.0-5.9	0.2-1.0	.43	.43			
805B:												
Orthents, clayey----	0-6	40-55	1.50-1.65	0.02-0.06	0.08-0.14	6.0-8.9	0.5-2.0	.43	.43	5	4	86
	6-60	35-60	1.60-1.90	0.02-0.06	0.03-0.10	6.0-8.9	0.2-1.0	.43	.43			
830.												
Landfills												
839B:												
Udipsamments, Typic	0-4	1-5	1.45-1.65	6-20	0.05-0.09	0.0-2.9	0.5-1.5	.02	.02	5	1	250
	4-12	0-4	1.45-1.65	6-20	0.04-0.08	0.0-2.9	0.0-0.5	.05	.05			
	12-60	0-4	1.50-1.70	6-20	0.03-0.07	0.0-2.9	0.0-0.5	.02	.02			
Udipsamments, Aquic	0-7	1-5	1.45-1.65	6-20	0.05-0.09	0.0-2.9	0.5-2.0	.02	.02	5	1	250
	7-20	0-4	1.45-1.65	6-20	0.04-0.08	0.0-2.9	0.0-0.5	.05	.05			
	20-60	0-4	1.50-1.70	6-20	0.03-0.07	0.0-2.9	0.0-0.5	.02	.02			
840B:												
Zurich--------------	0-5	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-9	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	9-28	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	28-38	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-64	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
840B:												
Ozaukee-------------	0-4	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-10	15-27	1.35-1.55	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	10-21	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	21-39	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	39-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
840C2:												
Zurich--------------	0-11	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	11-27	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	27-40	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	40-60	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
Ozaukee-------------	0-6	15-27	1.30-1.50	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	4	6	48
	6-21	35-50	1.60-1.70	0.06-0.6	0.10-0.20	3.0-5.9	0.2-0.5	.37	.37			
	21-28	30-42	1.65-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	28-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
865.												
Pits, gravel												
969E2:												
Casco---------------	0-5	12-25	1.35-1.55	0.6-2	0.19-0.24	0.0-2.9	1.0-2.0	.32	.32	3	5	56
	5-19	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	19-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
Rodman--------------	0-6	8-25	1.20-1.50	2-6	0.10-0.12	0.0-2.9	2.0-3.0	.20	.24	3	8	0
	6-10	5-25	1.10-1.50	2-6	0.09-0.12	0.0-2.9	0.0-2.0	.24	.28			
	10-60	0-10	1.60-1.70	20-100	0.02-0.04	0.0-2.9	0.0-1.0	.02	.05			
969F:												
Casco---------------	0-4	12-25	1.35-1.55	0.6-2	0.19-0.24	0.0-2.9	1.0-3.0	.32	.32	3	5	56
	4-15	18-35	1.55-1.65	0.6-2	0.09-0.19	3.0-5.9	0.2-1.0	.28	.32			
	15-60	0-5	1.45-1.70	20-100	0.02-0.04	0.0-2.9	0.0-0.5	.02	.05			
Rodman--------------	0-11	8-25	1.20-1.50	2-6	0.10-0.12	0.0-2.9	2.0-4.0	.20	.24	3	8	0
	11-14	5-25	1.10-1.50	2-6	0.09-0.12	0.0-2.9	0.0-2.0	.24	.28			
	14-60	0-10	1.60-1.70	20-100	0.02-0.04	0.0-2.9	0.0-1.0	.02	.05			
978A:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-14	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	14-30	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	30-38	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Beecher-------------	0-9	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	9-21	35-50	1.40-1.60	0.06-0.6	0.11-0.15	3.0-5.9	0.2-1.0	.37	.37			
	21-37	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	37-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
978B:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-33	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	33-39	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	39-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Beecher-------------	0-7	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	7-24	35-50	1.40-1.60	0.06-0.6	0.11-0.15	3.0-5.9	0.2-1.0	.37	.37			
	24-36	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	36-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
979A:												
Grays---------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-12	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	12-35	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	35-42	8-25	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Markham-------------	0-8	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	8-11	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.37	.37			
	11-24	35-50	1.40-1.60	0.06-0.6	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37			
	24-37	30-45	1.55-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	37-60	27-38	1.65-1.85	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
979B:												
Grays---------------	0-8	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	8-11	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	11-34	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	34-42	8-25	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Markham-------------	0-8	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	8-21	35-50	1.40-1.60	0.06-0.6	0.11-0.20	3.0-5.9	0.2-1.0	.37	.37			
	21-32	30-45	1.55-1.75	0.06-0.2	0.10-0.20	3.0-5.9	0.1-0.5	.37	.37			
	32-60	27-38	1.65-1.85	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
981A:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-14	15-27	1.20-1.35	0.6-2	0.20-0.22	0.0-2.9	0.5-1.0	.43	.43			
	14-30	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	30-38	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Frankfort-----------	0-9	20-27	1.25-1.45	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	9-14	27-32	1.30-1.50	0.6-2	0.19-0.22	0.0-2.9	0.5-2.0	.37	.37			
	14-24	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	24-34	40-55	1.60-1.75	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	34-60	35-50	1.65-1.85	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
981B:												
Wauconda------------	0-9	15-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	2.0-4.0	.37	.37	5	6	48
	9-33	25-35	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	33-39	10-27	1.40-1.60	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	39-60	5-20	1.50-1.70	0.6-6	0.05-0.16	0.0-2.9	0.0-0.2	.28	.28			
Frankfort-----------	0-8	20-27	1.25-1.45	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	4	6	48
	8-12	27-32	1.30-1.50	0.6-2	0.19-0.22	0.0-2.9	0.5-2.0	.37	.37			
	12-32	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	32-37	40-55	1.60-1.75	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	37-60	35-50	1.65-1.85	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
982A:												
Aptakisic-----------	0-3	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-8	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	8-24	27-35	1.40-1.60	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	24-33	10-30	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	33-80	5-30	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
Nappanee------------	0-5	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	5-8	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	8-26	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	26-48	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	48-75	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
982B:												
Aptakisic-----------	0-6	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	6-10	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	10-29	27-35	1.40-1.60	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	29-35	10-30	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	35-60	5-30	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
Nappanee------------	0-4	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-9	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-23	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	23-46	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	46-60	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
983B:												
Zurich--------------	0-5	15-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-9	15-27	1.30-1.50	0.6-2	0.21-0.23	0.0-2.9	0.5-1.0	.49	.49			
	9-28	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.2-1.0	.37	.37			
	28-38	10-27	1.45-1.65	0.6-2	0.12-0.19	0.0-2.9	0.2-0.5	.32	.32			
	38-64	5-25	1.50-1.75	0.6-6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.28			
Nappanee------------	0-4	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	4	6	48
	4-9	18-27	1.30-1.50	0.6-2	0.20-0.22	0.0-2.9	0.2-1.0	.37	.37			
	9-23	45-60	1.40-1.65	0.06-0.2	0.08-0.14	3.0-5.9	0.2-1.0	.32	.32			
	23-46	40-55	1.60-1.80	0.02-0.06	0.06-0.12	3.0-5.9	0.1-0.5	.32	.32			
	46-60	30-45	1.70-1.90	0.02-0.06	0.01-0.05	3.0-5.9	0.0-0.5	.37	.37			
984B:												
Barrington----------	0-11	20-27	1.20-1.40	0.6-2	0.22-0.26	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	11-32	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	32-42	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
Varna---------------	0-12	20-27	1.15-1.35	0.6-2	0.22-0.24	0.0-2.9	2.5-4.0	.24	.24	4	6	48
	12-30	35-50	1.40-1.60	0.06-0.6	0.10-0.19	3.0-5.9	0.5-1.5	.37	.37			
	30-48	30-45	1.50-1.70	0.06-0.2	0.10-0.19	3.0-5.9	0.2-1.0	.37	.37			
	48-60	27-40	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
989A:												
Mundelein-----------	0-17	20-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	17-31	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	31-42	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	42-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
Elliott-------------	0-6	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	3.5-5.0	.24	.24	4	6	48
	6-11	27-35	1.20-1.40	0.6-2	0.19-0.22	3.0-5.9	2.5-4.0	.20	.20			
	11-16	40-50	1.40-1.60	0.06-0.6	0.10-0.13	6.0-8.9	0.5-1.5	.32	.32			
	16-41	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	41-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			
989B:												
Mundelein-----------	0-12	20-27	1.15-1.30	0.6-2	0.22-0.24	0.0-2.9	3.0-5.0	.28	.28	5	6	48
	12-30	25-35	1.20-1.45	0.6-2	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37			
	30-37	15-30	1.40-1.55	0.6-2	0.12-0.18	0.0-2.9	0.2-0.5	.32	.32			
	37-60	5-25	1.50-1.70	0.6-6	0.05-0.15	0.0-2.9	0.0-0.2	.28	.28			
Elliott-------------	0-9	20-27	1.25-1.45	0.6-2	0.22-0.24	0.0-2.9	3.5-5.0	.24	.24	4	6	48
	9-13	27-35	1.20-1.40	0.6-2	0.19-0.22	3.0-5.9	2.5-4.0	.20	.20			
	13-17	38-45	1.40-1.60	0.06-0.6	0.11-0.14	6.0-8.9	0.5-1.5	.32	.32			
	17-35	27-40	1.50-1.70	0.06-0.6	0.14-0.18	3.0-5.9	0.1-0.5	.37	.37			
	35-60	27-35	1.70-1.90	0.06-0.2	0.05-0.10	0.0-2.9	0.0-0.5	.43	.43			

Table 22.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
1082A:												
Millington----------	0-21	20-27	1.35-1.55	0.6-2	0.20-0.24	0.0-2.9	4.0-6.0	.32	.32	5	4L	86
	21-37	20-35	1.40-1.60	0.6-2	0.17-0.20	3.0-5.9	1.0-3.0	.32	.32			
	37-60	18-35	1.50-1.70	0.6-2	0.14-0.20	3.0-5.9	0.1-2.0	.28	.28			
1103A:												
Houghton------------	0-7	---	0.20-0.35	0.2-6	0.35-0.45	---	70-99	---	---	3	2	134
	7-60	---	0.15-0.25	0.2-6	0.35-0.45	---	70-99	---	---			
1107A:												
Sawmill-------------	0-28	27-35	1.25-1.40	0.6-2	0.19-0.22	3.0-5.9	4.0-7.0	.28	.28	5	6	48
	28-42	27-35	1.30-1.45	0.6-2	0.17-0.20	3.0-5.9	1.0-3.5	.32	.32			
	42-60	25-35	1.35-1.50	0.6-2	0.17-0.20	3.0-5.9	0.2-2.0	.32	.32			
1210A:												
Lena----------------	0-11	---	0.15-0.45	2-6	0.35-0.45	---	60-99	---	---	3	2	134
	11-60	---	0.15-0.45	2-6	0.35-0.45	---	60-99	---	---			
1330A:												
Peotone-------------	0-22	33-40	1.20-1.40	0.2-0.6	0.21-0.23	6.0-8.9	5.0-7.0	.24	.24	5	4	86
	22-43	35-45	1.30-1.60	0.2-0.6	0.11-0.20	6.0-8.9	0.5-3.0	.37	.37			
	43-60	25-42	1.40-1.65	0.2-0.6	0.10-0.20	6.0-8.9	0.2-0.5	.43	.43			
1529A:												
Selmass-------------	0-23	18-27	1.35-1.45	0.6-2	0.20-0.24	0.0-2.9	4.0-6.0	.24	.24	4	6	48
	23-36	20-35	1.40-1.55	0.6-2	0.15-0.19	3.0-5.9	0.5-2.0	.32	.32			
	36-50	10-20	1.45-1.65	0.6-6	0.08-0.19	0.0-2.9	0.0-0.5	.28	.28			
	50-60	1-10	1.55-1.70	6-20	0.02-0.10	0.0-2.9	0.0-0.5	.05	.05			
3107A:												
Sawmill-------------	0-29	27-35	1.25-1.40	0.6-2	0.19-0.22	3.0-5.9	4.0-7.0	.28	.28	5	6	48
	29-48	27-35	1.30-1.45	0.6-2	0.17-0.20	3.0-5.9	1.0-3.5	.32	.32			
	48-60	25-35	1.35-1.50	0.6-2	0.17-0.20	3.0-5.9	0.2-2.0	.32	.32			
4103A:												
Houghton------------	0-9	---	0.20-0.35	0.2-6	0.35-0.45	---	70-99	---	---	3	2	134
	9-60	---	0.15-0.25	0.2-6	0.35-0.45	---	70-99	---	---			
4777A:												
Adrian--------------	0-13	---	0.20-0.35	0.2-6	0.35-0.45	---	70-99	---	---	2	2	134
	13-26	---	0.15-0.25	0.2-6	0.35-0.45	---	70-99	---	---			
	26-60	1-10	1.45-1.75	6-20	0.03-0.08	0.0-2.9	0.0-1.0	.05	.05			
8082A:												
Millington----------	0-26	20-27	1.35-1.55	0.6-2	0.20-0.24	0.0-2.9	4.0-6.0	.32	.32	5	4L	86
	26-36	20-35	1.40-1.60	0.6-2	0.17-0.20	3.0-5.9	1.0-3.0	.32	.32			
	36-62	18-35	1.50-1.70	0.6-2	0.14-0.20	3.0-5.9	0.1-2.0	.28	.28			

Table 23.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
23A:					
Blount----------	0-7	13-20	5.1-7.3	2.0-3.0	0
	7-13	7.0-16	5.1-7.3	0.2-1.0	0
	13-26	17-26	4.5-6.5	0.2-1.0	0
	26-32	13-24	6.1-7.8	0.0-0.5	0-25
	32-60	13-21	7.4-8.4	0.0-0.5	15-35
23B:					
Blount----------	0-6	13-20	5.1-7.3	2.0-3.0	0
	6-10	7.0-16	5.1-7.3	0.2-1.0	0
	10-23	17-26	4.5-6.5	0.2-1.0	0
	23-34	13-24	6.1-7.8	0.0-0.5	0-25
	34-60	13-21	7.4-8.4	0.0-0.5	15-35
67A:					
Harpster--------	0-18	27-40	7.9-8.4	3.5-6.0	15-40
	18-41	18-27	7.4-8.4	0.5-1.5	5-40
	41-56	9.0-23	7.9-8.4	0.0-0.5	5-40
	56-60	4.0-16	7.9-8.4	0.0-0.5	10-40
103A:					
Houghton--------	0-11	140-200	5.6-7.8	70-99	0
	11-60	100-200	5.6-7.8	70-99	0
134A:					
Camden----------	0-9	10-22	5.1-7.3	1.0-3.0	0
	9-14	9.0-18	5.1-7.3	0.5-1.0	0
	14-29	13-23	5.1-7.3	0.2-1.0	0
	29-60	10-19	5.1-7.3	0.0-0.5	0
	60-71	3.0-13	5.6-8.4	0.0-0.5	0-20
134B:					
Camden----------	0-7	10-22	5.1-7.3	1.0-3.0	0
	7-10	9.0-18	5.1-7.3	0.5-1.0	0
	10-33	13-23	5.1-7.3	0.2-1.0	0
	33-52	10-19	5.1-7.3	0.0-0.5	0
	52-60	3.0-13	5.6-8.4	0.0-0.5	0-20
146A:					
Elliott---------	0-6	16-32	5.6-7.3	3.5-5.0	0
	6-11	27-40	5.6-7.3	2.5-4.0	0
	11-16	17-38	6.1-7.3	0.5-1.5	0
	16-41	13-24	6.6-7.8	0.1-0.5	0-15
	41-60	11-22	7.4-8.4	0.0-0.5	10-35
146B:					
Elliott---------	0-9	16-32	5.6-7.3	3.5-5.0	0
	9-13	27-40	5.6-7.3	2.5-4.0	0
	13-17	15-36	6.1-7.3	0.5-1.5	0
	17-35	13-24	6.6-7.8	0.1-0.5	0-15
	35-60	11-22	7.4-8.4	0.0-0.5	10-35
153A:					
Pella-----------	0-12	24-33	6.1-7.8	4.0-6.0	0
	12-33	17-23	6.6-7.8	0.5-2.0	0-10
	33-42	9.0-19	7.4-8.4	0.2-0.5	5-30
	42-60	6.0-18	7.8-8.4	0.0-0.2	5-40

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
153A+:					
Pella-----------	0-16	14-22	5.6-7.3	2.0-4.0	0
	16-30	24-33	6.1-7.8	4.0-6.0	0
	30-53	17-23	6.6-7.8	0.5-2.0	0-10
	53-62	9.0-19	7.4-8.4	0.2-0.5	5-30
	62-80	6.0-18	7.8-8.4	0.0-0.2	5-40
189A:					
Martinton-------	0-12	18-24	5.6-7.3	4.0-5.0	0
	12-39	18-24	5.6-7.8	0.5-2.0	0-10
	39-60	7.0-22	7.4-8.4	0.0-0.5	5-30
189B:					
Martinton-------	0-10	18-24	5.6-7.3	4.0-5.0	0
	10-34	18-24	5.6-7.8	0.5-2.0	0-10
	34-60	7.0-22	7.4-8.4	0.0-0.5	5-30
192A:					
Del Rey---------	0-4	10-20	4.5-7.3	1.0-3.0	0
	4-9	8.0-15	4.5-7.3	0.2-1.0	0
	9-33	18-24	4.5-7.8	0.0-1.0	0
	33-41	15-22	7.4-8.4	0.0-0.5	0-20
	41-60	11-18	7.4-8.4	0.0-0.5	5-40
192B:					
Del Rey---------	0-5	10-20	4.5-7.3	1.0-3.0	0
	5-8	8.0-15	4.5-7.3	0.2-1.0	0
	8-22	18-24	4.5-7.8	0.0-1.0	0
	22-34	15-22	7.4-8.4	0.0-0.5	0-20
	34-60	11-18	7.4-8.4	0.0-0.5	5-40
219A:					
Millbrook-------	0-8	15-24	5.1-7.3	2.0-4.0	0
	8-12	10-18	5.1-7.3	0.5-1.0	0
	12-26	15-23	5.1-7.3	0.0-1.0	0
	26-41	11-20	5.1-7.8	0.0-0.5	0-5
	41-65	6.0-19	5.6-8.4	0.0-0.5	0-20
223B:					
Varna-----------	0-12	15-22	5.6-7.3	2.5-4.0	0
	12-30	18-28	5.6-7.3	0.5-1.5	0
	30-48	15-25	7.4-8.4	0.2-1.0	0-15
	48-60	13-21	7.9-8.4	0.0-0.5	5-30
223C2:					
Varna-----------	0-9	14-20	5.6-7.3	2.0-3.0	0
	9-29	18-28	5.6-7.3	0.5-1.5	0
	29-50	15-25	7.4-8.4	0.2-1.0	0-15
	50-60	13-21	7.9-8.4	0.0-0.5	5-30
228A:					
Nappanee--------	0-5	12-20	5.1-7.3	1.0-3.0	0
	5-8	9.0-16	5.1-7.3	0.2-1.0	0
	8-26	23-32	5.6-7.8	0.2-1.0	0
	26-48	20-29	7.4-8.4	0.1-0.5	10-30
	48-75	15-24	7.9-8.4	0.0-0.5	15-35
228B:					
Nappanee--------	0-4	12-20	5.1-7.3	1.0-3.0	0
	4-9	9.0-16	5.1-7.3	0.2-1.0	0
	9-23	23-32	5.6-7.8	0.2-1.0	0
	23-46	20-29	7.4-8.4	0.1-0.5	10-30
	46-60	15-24	7.9-8.4	0.0-0.5	15-35

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
228B2:					
Nappanee--------	0-5	15-24	5.1-7.3	1.0-2.5	0
	5-10	13-20	5.1-7.3	0.2-1.0	0
	10-22	23-32	5.6-7.8	0.2-1.0	0
	22-50	20-29	7.4-8.4	0.1-0.5	10-30
	50-70	15-24	7.9-8.4	0.0-0.5	15-35
228C2:					
Nappanee--------	0-5	15-24	5.1-7.3	1.0-2.5	0
	5-8	13-20	5.1-7.3	0.2-1.0	0
	8-23	23-32	5.6-7.8	0.2-1.0	0
	23-27	20-29	7.4-8.4	0.1-0.5	10-30
	27-80	15-24	7.9-8.4	0.0-0.5	15-35
232A:					
Ashkum----------	0-12	22-38	5.6-7.3	3.0-7.0	0
	12-29	22-39	6.1-7.3	0.5-2.5	0-5
	29-54	13-24	6.6-7.8	0.1-0.5	0-15
	54-60	11-22	7.4-8.4	0.0-0.5	10-25
298A:					
Beecher---------	0-9	17-24	5.1-7.3	2.0-4.0	0
	9-21	15-33	4.5-7.3	0.2-1.0	0
	21-37	13-24	6.1-7.8	0.1-0.5	0-15
	37-60	11-22	7.4-8.4	0.0-0.5	10-35
298B:					
Beecher---------	0-7	17-24	5.1-7.3	2.0-4.0	0
	7-24	15-33	4.5-7.3	0.2-1.0	0
	24-36	13-24	6.1-7.8	0.1-0.5	0-15
	36-60	11-22	7.4-8.4	0.0-0.5	10-35
318C2:					
Lorenzo---------	0-8	13-20	5.6-7.3	2.0-3.0	0
	8-15	10-20	5.6-7.8	0.0-1.0	15-35
	15-60	0.0-4.0	7.4-8.4	0.0-0.5	15-40
320A:					
Frankfort-------	0-9	14-22	5.6-7.3	2.0-4.0	0
	9-14	15-20	5.6-7.3	0.5-2.0	0
	14-24	23-32	6.1-7.8	0.2-1.0	0
	24-34	20-29	7.4-8.4	0.1-0.5	5-15
	34-60	17-26	7.9-8.4	0.0-0.5	15-30
320B:					
Frankfort-------	0-8	14-22	5.6-7.3	2.0-4.0	0
	8-12	15-20	5.6-7.3	0.5-2.0	0
	12-32	23-32	6.1-7.8	0.2-1.0	0
	32-37	20-29	7.4-8.4	0.1-0.5	5-15
	37-60	17-26	7.9-8.4	0.0-0.5	15-30
320B2:					
Frankfort-------	0-6	17-24	5.6-7.3	2.0-3.0	0
	6-21	23-32	6.1-7.8	0.2-1.0	0
	21-35	20-29	7.4-8.4	0.1-0.5	5-15
	35-60	17-26	7.9-8.4	0.0-0.5	15-30
323B:					
Casco-----------	0-6	8.0-21	5.6-7.3	1.0-3.0	0
	6-20	11-23	5.6-7.8	0.2-1.0	0-5
	20-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
323C2:					
Casco-----------	0-6	8.0-19	5.6-7.3	1.0-2.0	0
	6-18	11-23	5.6-7.8	0.2-1.0	0-5
	18-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25
323D2:					
Casco-----------	0-5	8.0-19	5.6-7.3	1.0-2.0	0
	5-16	11-23	5.6-7.8	0.2-1.0	0-5
	16-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25
323D3:					
Casco-----------	0-6	16-22	5.6-7.3	0.5-1.0	0
	6-12	11-23	5.6-7.8	0.2-1.0	0-5
	12-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25
325A:					
Dresden---------	0-9	13-22	5.6-7.3	2.0-4.0	0
	9-29	14-20	5.6-7.3	0.2-1.0	0
	29-33	10-16	5.6-7.8	0.0-0.5	0-15
	33-60	0.0-4.0	7.4-8.4	0.0-0.5	15-40
325B:					
Dresden---------	0-7	13-22	5.6-7.3	2.0-4.0	0
	7-27	14-20	5.6-7.3	0.2-1.0	0
	27-32	10-16	5.6-7.8	0.0-0.5	0-15
	32-60	0.0-4.0	7.4-8.4	0.0-0.5	15-40
327A:					
Fox-------------	0-10	11-21	5.1-7.3	1.0-3.0	0
	10-21	11-22	5.1-7.3	0.2-0.5	0
	21-33	10-22	5.6-7.8	0.0-0.5	0-30
	33-60	0.0-3.0	7.4-8.4	0.0-0.5	5-45
327B:					
Fox-------------	0-7	11-21	5.1-7.3	1.0-3.0	0
	7-11	11-22	5.1-7.3	0.2-0.5	0
	11-32	10-22	5.6-7.8	0.0-0.5	0-30
	32-60	0.0-3.0	7.4-8.4	0.0-0.5	5-45
327C2:					
Fox-------------	0-9	11-19	5.1-7.3	1.0-2.0	0
	9-21	11-22	5.1-7.3	0.2-0.5	0
	21-34	10-22	5.6-7.8	0.0-0.5	0-30
	34-60	0.0-3.0	7.4-8.4	0.0-0.5	5-45
327D2:					
Fox-------------	0-8	11-19	5.1-7.3	1.0-2.0	0
	8-28	10-22	5.6-7.8	0.0-0.5	0-30
	28-60	0.0-3.0	7.4-8.4	0.0-0.5	5-45
330A:					
Peotone---------	0-13	30-38	5.6-7.8	5.0-7.0	0
	13-50	22-33	6.1-7.8	0.5-3.0	0
	50-60	15-26	6.6-8.4	0.2-0.5	0-15
365A:					
Aptakisic-------	0-3	12-22	5.1-7.3	1.0-3.0	0
	3-8	10-18	5.1-7.3	0.5-1.0	0
	8-24	16-23	5.1-7.3	0.2-1.0	0
	24-33	6.0-19	6.1-8.4	0.2-0.5	0-20
	33-80	3.0-19	7.4-8.4	0.0-0.5	5-30

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
367. Beach sand					
370B:					
Saylesville-----	0-9	10-20	5.6-7.3	1.0-3.0	0
	9-21	18-24	4.5-7.8	0.0-1.0	0
	21-34	15-22	7.4-8.4	0.0-0.5	0-20
	34-60	11-18	7.9-8.4	0.0-0.5	5-40
370C2:					
Saylesville-----	0-7	10-18	5.6-7.3	1.0-2.0	0
	7-28	18-24	4.5-7.8	0.0-1.0	0
	28-38	15-22	7.4-8.4	0.0-0.5	0-20
	38-60	11-18	7.9-8.4	0.0-0.5	5-40
442A:					
Mundelein-------	0-17	18-26	5.6-7.3	3.0-5.0	0
	17-31	16-25	5.6-7.8	0.5-2.0	0-10
	31-42	9.0-19	6.1-8.4	0.2-0.5	0-20
	42-60	3.0-15	7.4-8.4	0.0-0.2	5-30
442B:					
Mundelein-------	0-12	18-26	5.6-7.3	3.0-5.0	0
	12-30	16-25	5.6-7.8	0.5-2.0	0-10
	30-37	9.0-19	6.1-8.4	0.2-0.5	0-20
	37-60	3.0-15	7.4-8.4	0.0-0.2	5-30
443A:					
Barrington------	0-13	18-26	5.6-7.3	3.0-5.0	0
	13-28	16-25	5.6-7.8	0.5-2.0	0-10
	28-44	9.0-19	6.1-8.4	0.2-0.5	0-20
	44-66	3.0-15	7.4-8.4	0.0-0.2	5-30
443B:					
Barrington------	0-11	18-26	5.6-7.3	3.0-5.0	0
	11-32	16-25	5.6-7.8	0.5-2.0	0-10
	32-42	9.0-19	6.1-8.4	0.2-0.5	0-20
	42-60	3.0-15	7.4-8.4	0.0-0.2	5-30
465A:					
Montgomery------	0-18	23-32	6.1-7.3	3.0-6.0	0
	18-40	21-32	6.1-7.8	0.5-2.0	0-5
	40-48	17-27	7.4-8.4	0.0-1.0	0-30
	48-60	16-25	7.4-8.4	0.0-0.5	20-35
488A:					
Hooppole--------	0-17	20-30	7.4-8.4	4.0-7.0	5-30
	17-44	16-25	7.4-8.4	0.5-2.0	12-30
	44-60	1.0-8.0	7.4-8.4	0.0-0.5	10-30
513A:					
Granby----------	0-8	6.0-20	5.6-7.3	3.0-5.0	0
	8-17	1.0-12	5.6-7.3	0.5-2.0	0
	17-30	0.0-11	5.6-7.8	0.2-1.5	0
	30-80	0.0-7.0	6.1-8.4	0.0-0.5	0-10
523A:					
Dunham----------	0-12	25-34	5.6-7.3	4.0-6.0	0
	12-35	16-26	5.6-7.3	0.5-2.0	0
	35-44	6.0-19	6.1-7.8	0.1-0.5	0-20
	44-60	1.0-7.0	7.4-8.4	0.0-0.5	15-40

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
526A:					
Grundelein------	0-11	19-30	5.6-7.3	4.0-5.0	0
	11-33	16-26	5.6-7.3	0.5-2.0	0
	33-39	6.0-19	6.1-7.8	0.1-0.5	0-20
	39-60	1.0-7.0	7.4-8.4	0.0-0.5	15-40
530B:					
Ozaukee---------	0-4	9.0-20	6.1-7.3	1.0-3.0	0
	4-10	7.0-16	6.1-7.3	0.2-1.0	0
	10-21	20-26	6.1-7.3	0.2-0.5	0
	21-39	15-22	7.4-8.4	0.1-0.5	0-20
	39-60	13-19	7.9-8.4	0.0-0.5	10-40
530B2:					
Ozaukee---------	0-4	9.0-18	6.1-7.3	1.0-2.0	0
	4-22	20-26	6.1-7.3	0.2-0.5	0
	22-27	15-22	7.4-8.4	0.1-0.5	0-20
	27-60	13-19	7.9-8.4	0.0-0.5	10-40
530C:					
Ozaukee---------	0-5	9.0-20	6.1-7.3	1.0-3.0	0
	5-10	7.0-16	6.1-7.3	0.2-1.0	0
	10-33	20-26	6.1-7.3	0.2-0.5	0
	33-38	15-22	7.4-8.4	0.1-0.5	0-20
	38-60	13-19	7.9-8.4	0.0-0.5	10-40
530C2:					
Ozaukee---------	0-6	9.0-18	6.1-7.3	1.0-2.0	0
	6-21	20-26	6.1-7.3	0.2-0.5	0
	21-28	15-22	7.4-8.4	0.1-0.5	0-20
	28-60	13-19	7.9-8.4	0.0-0.5	10-40
530C3:					
Ozaukee---------	0-7	14-22	6.1-7.3	0.5-1.0	0
	7-23	20-26	6.1-7.3	0.2-0.5	0
	23-34	15-22	7.4-8.4	0.1-0.5	0-20
	34-60	13-19	7.9-8.4	0.0-0.5	10-40
530D:					
Ozaukee---------	0-4	9.0-20	6.1-7.3	1.0-3.0	0
	4-9	7.0-16	6.1-7.3	0.2-1.0	0
	9-34	20-26	6.1-7.3	0.2-0.5	0
	34-39	15-22	7.4-8.4	0.1-0.5	0-20
	39-60	13-19	7.9-8.4	0.0-0.5	10-40
530D2:					
Ozaukee---------	0-6	9.0-18	6.1-7.3	1.0-2.0	0
	6-20	20-26	6.1-7.3	0.2-0.5	0
	20-28	15-22	7.4-8.4	0.1-0.5	0-20
	28-60	13-19	7.9-8.4	0.0-0.5	10-40
530D3:					
Ozaukee---------	0-9	14-22	6.1-7.3	0.5-1.0	0
	9-17	20-26	6.1-7.3	0.2-0.5	0
	17-37	15-22	7.4-8.4	0.1-0.5	0-20
	37-60	13-19	7.9-8.4	0.0-0.5	10-40
530E:					
Ozaukee---------	0-4	9.0-20	6.1-7.3	1.0-3.0	0
	4-8	7.0-16	6.1-7.3	0.2-1.0	0
	8-20	20-26	6.1-7.3	0.2-0.5	0
	20-25	15-22	7.4-8.4	0.1-0.5	0-20
	25-60	13-19	7.9-8.4	0.0-0.5	10-40

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
530E2:					
Ozaukee---------	0-6	9.0-18	6.1-7.3	1.0-2.0	0
	6-27	20-26	6.1-7.3	0.2-0.5	0
	27-31	15-22	7.4-8.4	0.1-0.5	0-20
	31-60	13-19	7.9-8.4	0.0-0.5	10-40
530F:					
Ozaukee---------	0-5	9.0-20	6.1-7.3	1.0-3.0	0
	5-29	20-26	6.1-7.3	0.2-0.5	0
	29-36	15-22	7.4-8.4	0.1-0.5	0-20
	36-60	13-19	7.9-8.4	0.0-0.5	10-40
531B:					
Markham---------	0-8	14-22	5.6-7.3	2.0-4.0	0
	8-21	17-27	5.1-7.3	0.2-1.0	0
	21-32	15-24	7.4-8.4	0.1-0.5	0-10
	32-60	13-20	7.9-8.4	0.0-0.5	5-30
531C2:					
Markham---------	0-8	14-20	5.6-7.3	2.0-3.0	0
	8-20	17-27	5.1-7.3	0.2-1.0	0
	20-29	15-24	7.4-8.4	0.1-0.5	0-10
	29-60	13-20	7.9-8.4	0.0-0.5	5-30
531D2:					
Markham---------	0-7	14-20	5.6-7.3	2.0-3.0	0
	7-20	17-27	5.1-7.3	0.2-1.0	0
	20-30	15-24	7.4-8.4	0.1-0.5	0-10
	30-60	13-20	7.9-8.4	0.0-0.5	5-30
557A:					
Millstream------	0-8	15-24	5.1-7.3	2.0-4.0	0
	8-14	10-18	5.1-7.3	0.5-1.0	0
	14-27	15-23	5.1-7.3	0.0-1.0	0
	27-47	10-19	5.1-7.8	0.0-0.5	0-20
	47-60	1.0-7.0	7.4-8.4	0.0-0.5	15-40
570B:					
Martinsville----	0-5	7.0-16	5.1-7.3	1.0-3.0	0
	5-12	4.0-13	5.1-7.3	0.5-1.5	0
	12-38	10-19	5.1-7.3	0.2-1.0	0
	38-53	7.0-14	5.1-7.3	0.1-0.5	0
	53-60	2.0-11	5.6-7.8	0.0-0.5	0-25
570C2:					
Martinsville----	0-9	7.0-14	5.1-7.3	1.0-2.0	0
	9-29	10-19	5.1-7.3	0.2-1.0	0
	29-59	7.0-14	5.1-7.3	0.1-0.5	0
	59-70	2.0-11	5.6-7.8	0.0-0.5	0-25
626A:					
Kish------------	0-11	20-28	7.4-8.4	4.0-6.0	5-30
	11-47	11-23	7.4-8.4	0.0-2.0	5-30
	47-60	7.0-20	7.4-8.4	0.0-1.0	5-30
696A:					
Zurich----------	0-5	11-22	5.6-7.3	1.0-3.0	0
	5-10	10-18	5.6-7.3	0.5-1.0	0
	10-29	16-23	5.1-7.8	0.2-1.0	0-10
	29-36	6.0-18	6.6-8.4	0.2-0.5	0-20
	36-60	3.0-16	7.4-8.4	0.0-0.5	5-30

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
696B:					
Zurich----------	0-5	11-22	5.6-7.3	1.0-3.0	0
	5-9	10-18	5.6-7.3	0.5-1.0	0
	9-28	16-23	5.1-7.8	0.2-1.0	0-10
	28-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-64	3.0-16	7.4-8.4	0.0-0.5	5-30
696C2:					
Zurich----------	0-10	11-20	5.6-7.3	1.0-2.0	0
	10-27	16-23	5.1-7.8	0.2-1.0	0-10
	27-40	6.0-18	6.6-8.4	0.2-0.5	0-20
	40-60	3.0-16	7.4-8.4	0.0-0.5	5-30
696D2:					
Zurich----------	0-6	11-20	5.6-7.3	1.0-2.0	0
	6-25	16-23	5.1-7.8	0.2-1.0	0-10
	25-35	6.0-18	6.6-8.4	0.2-0.5	0-20
	35-60	3.0-16	7.4-8.4	0.0-0.5	5-30
697A:					
Wauconda--------	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-14	10-18	5.6-7.3	0.5-1.0	0
	14-30	15-23	5.6-7.8	0.2-1.0	0-5
	30-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-60	3.0-13	7.4-8.4	0.0-0.2	5-30
697B:					
Wauconda--------	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-33	15-23	5.6-7.8	0.2-1.0	0-5
	33-39	6.0-18	6.6-8.4	0.2-0.5	0-20
	39-60	3.0-13	7.4-8.4	0.0-0.2	5-30
698A:					
Grays-----------	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-12	10-18	5.6-7.3	0.5-1.0	0
	12-35	15-23	5.6-7.8	0.2-1.0	0-5
	35-42	5.0-16	6.6-8.4	0.2-0.5	0-20
	42-60	3.0-13	7.4-8.4	0.0-0.2	5-30
698B:					
Grays-----------	0-8	13-24	5.6-7.3	2.0-4.0	0
	8-11	10-18	5.6-7.3	0.5-1.0	0
	11-34	15-23	5.6-7.8	0.2-1.0	0-5
	34-42	5.0-16	6.6-8.4	0.2-0.5	0-20
	42-60	3.0-13	7.4-8.4	0.0-0.2	5-30
706B:					
Boyer-----------	0-4	3.0-10	5.6-7.3	0.5-2.0	0
	4-9	1.0-8.0	5.6-7.3	0.2-1.0	0
	9-31	4.0-9.0	5.6-7.8	0.0-0.5	0-15
	31-62	0.0-5.0	7.4-8.4	0.0-0.5	5-45
706C:					
Boyer-----------	0-5	3.0-10	5.6-7.3	0.5-2.0	0
	5-10	1.0-8.0	5.6-7.3	0.2-1.0	0
	10-29	4.0-9.0	5.6-7.8	0.0-0.5	0-15
	29-60	0.0-5.0	7.4-8.4	0.0-0.5	5-45

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
791A:					
Rush-----------	0-4	9.0-22	5.1-7.3	1.0-3.0	0
	4-11	8.0-18	5.1-7.3	0.5-1.0	0
	11-38	15-23	4.5-6.5	0.5-1.0	0
	38-45	9.0-20	4.5-7.3	0.2-1.0	0
	45-60	1.0-5.0	7.4-8.4	0.0-0.5	10-35
791B:					
Rush-----------	0-7	9.0-22	5.1-7.3	1.0-3.0	0
	7-11	8.0-18	5.1-7.3	0.5-1.0	0
	11-35	15-23	4.5-6.5	0.5-1.0	0
	35-46	9.0-20	4.5-7.3	0.2-1.0	0
	46-60	1.0-5.0	7.4-8.4	0.0-0.5	10-35
791C2:					
Rush-----------	0-7	9.0-20	5.1-7.3	1.0-2.0	0
	7-37	15-23	4.5-6.5	0.5-1.0	0
	37-48	9.0-20	4.5-7.3	0.2-1.0	0
	48-60	1.0-5.0	7.4-8.4	0.0-0.5	10-35
792A:					
Bowes----------	0-9	16-24	5.1-7.3	2.0-4.0	0
	9-13	9.0-20	5.1-7.3	0.5-1.5	0
	13-43	16-23	5.1-6.5	0.2-1.0	0
	43-51	6.0-18	5.6-7.8	0.1-0.5	0-10
	51-61	2.0-7.0	7.4-8.4	0.0-0.5	10-40
792B:					
Bowes----------	0-7	16-24	5.1-7.3	2.0-4.0	0
	7-37	16-23	5.1-6.5	0.2-1.0	0
	37-43	6.0-18	5.6-7.8	0.1-0.5	0-10
	43-60	2.0-7.0	7.4-8.4	0.0-0.5	10-40
802B:					
Orthents, loamy	0-6	10-25	5.6-7.8	0.5-2.0	0-10
	6-60	10-20	5.6-8.4	0.2-1.0	0-20
805B:					
Orthents, clayey	0-6	22-38	5.6-7.8	0.5-2.0	0-10
	6-60	15-35	6.1-8.4	0.2-1.0	0-25
830.					
Landfills					
839B:					
Udipsamments, Typic----------	0-4	1.0-6.0	6.1-7.8	0.5-1.5	0
	4-12	0.0-3.0	6.6-7.8	0.0-0.5	0-20
	12-60	0.0-3.0	7.4-8.4	0.0-0.5	5-30
Udipsamments, Aquic----------	0-7	1.0-7.0	6.1-7.8	0.5-2.0	0
	7-20	0.0-3.0	6.6-7.8	0.0-0.5	0-20
	20-60	0.0-3.0	7.4-8.4	0.0-0.5	5-30
840B:					
Zurich----------	0-5	11-22	5.6-7.3	1.0-3.0	0
	5-9	10-18	5.6-7.3	0.5-1.0	0
	9-28	16-23	5.1-7.8	0.2-1.0	0-10
	28-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-64	3.0-16	7.4-8.4	0.0-0.5	5-30

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
840B:					
Ozaukee---------	0-4	9.0-20	6.1-7.3	1.0-3.0	0
	4-10	7.0-16	6.1-7.3	0.2-1.0	0
	10-21	20-26	6.1-7.3	0.2-0.5	0
	21-39	15-22	7.4-8.4	0.1-0.5	0-20
	39-60	13-19	7.9-8.4	0.0-0.5	10-40
840C2:					
Zurich----------	0-11	11-20	5.6-7.3	1.0-2.0	0
	11-27	16-23	5.1-7.8	0.2-1.0	0-10
	27-40	6.0-18	6.6-8.4	0.2-0.5	0-20
	40-60	3.0-16	7.4-8.4	0.0-0.5	5-30
Ozaukee---------	0-6	9.0-18	6.1-7.3	1.0-2.0	0
	6-21	20-26	6.1-7.3	0.2-0.5	0
	21-28	15-22	7.4-8.4	0.1-0.5	0-20
	28-60	13-19	7.9-8.4	0.0-0.5	10-40
865.					
Pits, gravel					
969E2:					
Casco-----------	0-5	8.0-19	5.6-7.3	1.0-2.0	0
	5-19	11-23	5.6-7.8	0.2-1.0	0-5
	19-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25
Rodman----------	0-6	8.0-19	6.6-7.8	2.0-3.0	0-15
	6-10	2.0-17	6.6-7.8	0.0-2.0	0-25
	10-60	0.0-7.0	7.4-8.4	0.0-1.0	10-45
969F:					
Casco-----------	0-4	8.0-21	5.6-7.3	1.0-3.0	0
	4-15	11-23	5.6-7.8	0.2-1.0	0-5
	15-60	0.0-4.0	7.4-8.4	0.0-0.5	1-25
Rodman----------	0-11	8.0-21	6.6-7.8	2.0-4.0	0-15
	11-14	2.0-17	6.6-7.8	0.0-2.0	0-25
	14-60	0.0-7.0	7.4-8.4	0.0-1.0	10-45
978A:					
Wauconda--------	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-14	10-18	5.6-7.3	0.5-1.0	0
	14-30	15-23	5.6-7.8	0.2-1.0	0-5
	30-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Beecher---------	0-9	17-24	5.1-7.3	2.0-4.0	0
	9-21	15-33	4.5-7.3	0.2-1.0	0
	21-37	13-24	6.1-7.8	0.1-0.5	0-15
	37-60	11-22	7.4-8.4	0.0-0.5	10-35
978B:					
Wauconda--------	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-33	15-23	5.6-7.8	0.2-1.0	0-5
	33-39	6.0-18	6.6-8.4	0.2-0.5	0-20
	39-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Beecher---------	0-7	17-24	5.1-7.3	2.0-4.0	0
	7-24	15-33	4.5-7.3	0.2-1.0	0
	24-36	13-24	6.1-7.8	0.1-0.5	0-15
	36-60	11-22	7.4-8.4	0.0-0.5	10-35

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
979A:					
Grays	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-12	10-18	5.6-7.3	0.5-1.0	0
	12-35	15-23	5.6-7.8	0.2-1.0	0-5
	35-42	5.0-16	6.6-8.4	0.2-0.5	0-20
	42-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Markham	0-8	14-22	5.6-7.3	2.0-4.0	0
	8-11	10-16	5.1-7.3	0.5-1.0	0
	11-24	17-27	5.1-7.3	0.2-1.0	0
	24-37	15-24	7.4-8.4	0.1-0.5	0-10
	37-60	13-20	7.9-8.4	0.0-0.5	5-30
979B:					
Grays	0-8	13-24	5.6-7.3	2.0-4.0	0
	8-11	10-18	5.6-7.3	0.5-1.0	0
	11-34	15-23	5.6-7.8	0.2-1.0	0-5
	34-42	5.0-16	6.6-8.4	0.2-0.5	0-20
	42-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Markham	0-8	14-22	5.6-7.3	2.0-4.0	0
	8-21	17-27	5.1-7.3	0.2-1.0	0
	21-32	15-24	7.4-8.4	0.1-0.5	0-10
	32-60	13-20	7.9-8.4	0.0-0.5	5-30
981A:					
Wauconda	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-14	10-18	5.6-7.3	0.5-1.0	0
	14-30	15-23	5.6-7.8	0.2-1.0	0-5
	30-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Frankfort	0-9	14-22	5.6-7.3	2.0-4.0	0
	9-14	15-20	5.6-7.3	0.5-2.0	0
	14-24	23-32	6.1-7.8	0.2-1.0	0
	24-34	20-29	7.4-8.4	0.1-0.5	5-15
	34-60	17-26	7.9-8.4	0.0-0.5	15-30
981B:					
Wauconda	0-9	13-24	5.6-7.3	2.0-4.0	0
	9-33	15-23	5.6-7.8	0.2-1.0	0-5
	33-39	6.0-18	6.6-8.4	0.2-0.5	0-20
	39-60	3.0-13	7.4-8.4	0.0-0.2	5-30
Frankfort	0-8	14-22	5.6-7.3	2.0-4.0	0
	8-12	15-20	5.6-7.3	0.5-2.0	0
	12-32	23-32	6.1-7.8	0.2-1.0	0
	32-37	20-29	7.4-8.4	0.1-0.5	5-15
	37-60	17-26	7.9-8.4	0.0-0.5	15-30
982A:					
Aptakisic	0-3	12-22	5.1-7.3	1.0-3.0	0
	3-8	10-18	5.1-7.3	0.5-1.0	0
	8-24	16-23	5.1-7.3	0.2-1.0	0
	24-33	6.0-19	6.1-8.4	0.2-0.5	0-20
	33-80	3.0-19	7.4-8.4	0.0-0.5	5-30
Nappanee	0-5	12-20	5.1-7.3	1.0-3.0	0
	5-8	9.0-16	5.1-7.3	0.2-1.0	0
	8-26	23-32	5.6-7.8	0.2-1.0	0
	26-48	20-29	7.4-8.4	0.1-0.5	10-30
	48-75	15-24	7.9-8.4	0.0-0.5	15-35

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
982B:					
Aptakisic-------	0-6	12-22	5.1-7.3	1.0-3.0	0
	6-10	10-18	5.1-7.3	0.5-1.0	0
	10-29	16-23	5.1-7.3	0.2-1.0	0
	29-35	6.0-19	6.1-8.4	0.2-0.5	0-20
	35-60	3.0-19	7.4-8.4	0.0-0.5	5-30
Nappanee--------	0-4	12-20	5.1-7.3	1.0-3.0	0
	4-9	9.0-16	5.1-7.3	0.2-1.0	0
	9-23	23-32	5.6-7.8	0.2-1.0	0
	23-46	20-29	7.4-8.4	0.1-0.5	10-30
	46-60	15-24	7.9-8.4	0.0-0.5	15-35
983B:					
Zurich----------	0-5	11-22	5.6-7.3	1.0-3.0	0
	5-9	10-18	5.6-7.3	0.5-1.0	0
	9-28	16-23	5.1-7.8	0.2-1.0	0-10
	28-38	6.0-18	6.6-8.4	0.2-0.5	0-20
	38-64	3.0-16	7.4-8.4	0.0-0.5	5-30
Nappanee--------	0-4	12-20	5.1-7.3	1.0-3.0	0
	4-9	9.0-16	5.1-7.3	0.2-1.0	0
	9-23	23-32	5.6-7.8	0.2-1.0	0
	23-46	20-29	7.4-8.4	0.1-0.5	10-30
	46-60	15-24	7.9-8.4	0.0-0.5	15-35
984B:					
Barrington------	0-11	18-26	5.6-7.3	3.0-5.0	0
	11-32	16-25	5.6-7.8	0.5-2.0	0-10
	32-42	9.0-19	6.1-8.4	0.2-0.5	0-20
	42-60	3.0-15	7.4-8.4	0.0-0.2	5-30
Varna-----------	0-12	15-22	5.6-7.3	2.5-4.0	0
	12-30	18-28	5.6-7.3	0.5-1.5	0
	30-48	15-25	7.4-8.4	0.2-1.0	0-15
	48-60	13-21	7.9-8.4	0.0-0.5	5-30
989A:					
Mundelein-------	0-17	18-26	5.6-7.3	3.0-5.0	0
	17-31	16-25	5.6-7.8	0.5-2.0	0-10
	31-42	9.0-19	6.1-8.4	0.2-0.5	0-20
	42-60	3.0-15	7.4-8.4	0.0-0.2	5-30
Elliott---------	0-6	16-32	5.6-7.3	3.5-5.0	0
	6-11	27-40	5.6-7.3	2.5-4.0	0
	11-16	17-38	6.1-7.3	0.5-1.5	0
	16-41	13-24	6.6-7.8	0.1-0.5	0-15
	41-60	11-22	7.4-8.4	0.0-0.5	10-35
989B:					
Mundelein-------	0-12	18-26	5.6-7.3	3.0-5.0	0
	12-30	16-25	5.6-7.8	0.5-2.0	0-10
	30-37	9.0-19	6.1-8.4	0.2-0.5	0-20
	37-60	3.0-15	7.4-8.4	0.0-0.2	5-30
Elliott---------	0-9	16-32	5.6-7.3	3.5-5.0	0
	9-13	27-40	5.6-7.3	2.5-4.0	0
	13-17	15-36	6.1-7.3	0.5-1.5	0
	17-35	13-24	6.6-7.8	0.1-0.5	0-15
	35-60	11-22	7.4-8.4	0.0-0.5	10-35

Table 23.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Organic matter	Calcium carbonate
	In	meq/100 g	pH	Pct	Pct
1082A:					
Millington------	0-21	20-28	7.4-8.4	4.0-6.0	5-20
	21-37	14-27	7.4-8.4	1.0-3.0	5-30
	37-60	11-25	7.4-8.4	0.1-2.0	10-30
1103A:					
Houghton--------	0-7	140-200	5.6-7.8	70-99	0
	7-60	100-200	5.6-7.8	70-99	0
1107A:					
Sawmill---------	0-28	23-35	6.1-7.3	4.0-7.0	0
	28-42	18-30	6.6-7.8	1.0-3.5	0-5
	42-60	15-27	6.6-8.4	0.2-2.0	0-10
1210A:					
Lena------------	0-11	140-180	7.4-8.4	60-99	5-40
	11-60	100-180	7.4-8.4	60-99	5-40
1330A:					
Peotone---------	0-22	30-38	5.6-7.8	5.0-7.0	0
	22-43	22-33	6.1-7.8	0.5-3.0	0
	43-60	15-26	6.6-8.4	0.2-0.5	0-15
1529A:					
Selmass---------	0-23	18-29	5.6-7.3	4.0-6.0	0
	23-36	13-25	5.6-7.3	0.5-2.0	0
	36-50	6.0-13	6.1-7.8	0.0-0.5	0-10
	50-60	1.0-7.0	6.6-8.4	0.0-0.5	0-20
3107A:					
Sawmill---------	0-29	23-35	6.1-7.3	4.0-7.0	0
	29-48	18-30	6.6-7.8	1.0-3.5	0-5
	48-60	15-27	6.6-8.4	0.2-2.0	0-10
4103A:					
Houghton--------	0-9	140-200	5.6-7.8	70-99	0
	9-60	100-200	5.6-7.8	70-99	0
4777A:					
Adrian----------	0-13	140-200	6.1-8.4	70-99	0-30
	13-26	100-200	5.6-7.8	70-99	0-20
	26-60	1.0-8.0	6.1-8.4	0.0-1.0	0-40
8082A:					
Millington------	0-26	20-28	7.4-8.4	4.0-6.0	5-20
	26-36	14-27	7.4-8.4	1.0-3.0	5-30
	36-62	11-25	7.4-8.4	0.1-2.0	10-30

Table 24.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
23A, 23B:										
Blount	C	Jan-May	0.5-2.0	2.5-5.5	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
67A:										
Harpster	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
103A:										
Houghton	A	Jan-Apr	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		May-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
134A, 134B:										
Camden	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
146A, 146B:										
Elliott	C	Jan-May	1.0-2.0	1.7-4.3	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
153A, 153A+:										
Pella	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
189A, 189B:										
Martinton	C	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
192A, 192B:										
Del Rey	C	Jan-May	0.5-2.0	2.0-4.5	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
219A:										
Millbrook	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
223B, 223C2:										
Varna	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-5.5	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
228A, 228B, 228B2, 228C2:										
Nappanee	D	Jan-May	0.5-2.0	2.0-5.5	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
232A:										
Ashkum	C	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
298A, 298B:										
Beecher	C	Jan-May	0.5-2.0	2.0-4.3	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 24.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
318C2:										
Lorenzo	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
320A, 320B, 320B2:										
Frankfort	D	Jan-May	0.5-2.0	2.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
323B, 323C2, 323D2, 323D3:										
Casco	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
325A, 325B:										
Dresden	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
327A, 327B, 327C2, 327D2:										
Fox	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
330A:										
Peotone	C	Jan-Jun	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
365A:										
Aptakisic	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
367. Beach sand										
370B, 370C2:										
Saylesville	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
442A, 442B:										
Mundelein	B	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
443A, 443B:										
Barrington	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
465A:										
Montgomery	D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
488A:										
Hooppole	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
513A:										
Granby	A	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
523A:										
Dunham	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 24.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
526A:										
Grundelein------------	B	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3, 530E, 530E2, 530F:										
Ozaukee--------------	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-4.3	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
531B, 531C2, 531D2:										
Markham---------------	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-5.1	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
557A:										
Millstream------------	B	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
570B, 570C2:										
Martinsville----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
626A:										
Kish------------------	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
696A, 696B, 696C2, 696D2:										
Zurich---------------	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
697A, 697B:										
Wauconda--------------	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
698A, 698B:										
Grays-----------------	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
706B, 706C:										
Boyer-----------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
791A, 791B, 791C2:										
Rush------------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
792A, 792B:										
Bowes-----------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
802B:										
Orthents, loamy-------	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	3.5-5.0	3.7-5.5	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
805B:										
Orthents, clayey------	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-4.0	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 24.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
830. Landfills										
839B:										
Udipsamments, Typic	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Udipsamments, Aquic	B	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
840B, 840C2:										
Zurich	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
Ozaukee	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-4.3	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
865. Pits, gravel										
969E2, 969F:										
Casco	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Rodman	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
978A, 978B:										
Wauconda	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
Beecher	C	Jan-May	0.5-2.0	2.0-4.3	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
979A, 979B:										
Grays	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
Markham	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-5.1	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
981A, 981B:										
Wauconda	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
Frankfort	D	Jan-May	0.5-2.0	2.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
982A, 982B:										
Aptakisic	B	Jan-May	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
Nappanee	D	Jan-May	0.5-2.0	2.0-5.5	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
983B:										
Zurich	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 24.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
983B:										
Nappanee	D	Jan-May	0.5-2.0	2.0-5.5	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
984B:										
Barrington	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
Varna	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.5	2.2-5.5	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
989A, 989B:										
Mundelein	B	Jan-May	1.0-2.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
Elliott	C	Jan-May	1.0-2.0	1.7-4.3	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
1082A:										
Millington	D	Jan	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Brief	Occasional
		Feb-Apr	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Long	Occasional
		May-Jun	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Occasional
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Occasional
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Brief	Occasional
1103A:										
Houghton	D	Jan-Apr	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		May-Jun	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jul-Oct	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
1107A:										
Sawmill	D	Jan	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Brief	Frequent
		Feb-Apr	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Long	Frequent
		May-Jun	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	Brief	Frequent
1210A:										
Lena	D	Jan-Apr	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		May-Jun	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jul-Oct	0.0-0.5	>6.0	Apparent	0.0-1.0	Brief	Frequent	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
1330A:										
Peotone	D	Jan-Mar	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None
		Apr-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Very long	Frequent	---	None

Table 24.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
1529A:										
Selmass	D	Jan-Apr	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		May-Jun	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov	0.0-0.5	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
3107A:										
Sawmill	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Frequent
		Jun	>6.0	>6.0	---	---	---	None	Brief	Frequent
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov-Dec	>6.0	>6.0	---	---	---	None	Brief	Frequent
4103A:										
Houghton	D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-2.0	Very long	Frequent	---	None
		Jun-Nov	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-2.0	Very long	Frequent	---	None
4777A:										
Adrian	D	Jan-May	0.0-0.5	>6.0	Apparent	0.0-2.0	Very long	Frequent	---	None
		Jun-Nov	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-2.0	Very long	Frequent	---	None
8082A:										
Millington	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	Brief	Occasional
		Jun	>6.0	>6.0	---	---	---	None	Brief	Occasional
		Jul-Oct	>6.0	>6.0	---	---	---	None	---	None
		Nov-Dec	>6.0	>6.0	---	---	---	None	Brief	Occasional

Table 25.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
23A, 23B:								
Blount	Dense material	30-48	Noncemented	---	---	High	High	High
67A:								
Harpster	---	---	---	---	---	High	High	Low
103A:								
Houghton	---	---	---	6-18	55-60	High	High	Moderate
134A, 134B:								
Camden	---	---	---	---	---	High	Moderate	Moderate
146A, 146B:								
Elliott	Dense material	20-45	Noncemented	---	---	Moderate	High	Moderate
153A, 153A+:								
Pella	---	---	---	---	---	High	High	Low
189A, 189B:								
Martinton	---	---	---	---	---	Moderate	High	Moderate
192A, 192B:								
Del Rey	---	---	---	---	---	High	High	High
219A:								
Millbrook	---	---	---	---	---	High	High	Moderate
223B, 223C2:								
Varna	Dense material	24-60	Noncemented	---	---	Moderate	High	Moderate
228A, 228B, 228B2, 228C2:								
Nappanee	Dense material	24-60	Noncemented	---	---	High	High	Moderate
232A:								
Ashkum	---	---	---	---	---	High	High	Low
298A, 298B:								
Beecher	Dense material	24-45	Noncemented	---	---	High	High	High
318C2:								
Lorenzo	---	---	---	---	---	Moderate	Moderate	Moderate
320A, 320B, 320B2:								
Frankfort	Dense material	24-42	Noncemented	---	---	High	High	Moderate
323B, 323C2, 323D2, 323D3:								
Casco	---	---	---	---	---	Moderate	Moderate	Moderate
325A, 325B:								
Dresden	---	---	---	---	---	Moderate	Moderate	Moderate
327A, 327B, 327C2, 327D2:								
Fox	---	---	---	---	---	Moderate	Moderate	Moderate

Table 25.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
330A:								
Peotone-------------	---	---	---	---	---	High	High	Moderate
365A:								
Aptakisic-----------	---	---	---	---	---	High	High	Moderate
367.								
Beach sand								
370B, 370C2:								
Saylesville---------	---	---	---	---	---	Moderate	High	Moderate
442A, 442B:								
Mundelein-----------	---	---	---	---	---	High	High	Moderate
443A, 443B:								
Barrington----------	---	---	---	---	---	High	Moderate	Moderate
465A:								
Montgomery----------	---	---	---	---	---	High	High	Low
488A:								
Hooppole------------	---	---	---	---	---	High	High	Low
513A:								
Granby--------------	---	---	---	---	---	Moderate	High	Moderate
523A:								
Dunham--------------	---	---	---	---	---	High	High	Moderate
526A:								
Grundelein----------	---	---	---	---	---	High	High	Moderate
530B, 530B2, 530C, 530C2, 530C3, 530D, 530D2, 530D3, 530E, 530E2, 530F:								
Ozaukee------------	Dense material	20-45	Noncemented	---	---	Moderate	High	Low
531B, 531C2, 531D2:								
Markham-------------	Dense material	20-55	Noncemented	---	---	Moderate	High	Moderate
557A:								
Millstream----------	---	---	---	---	---	High	High	Moderate
570B, 570C2:								
Martinsville--------	---	---	---	---	---	Moderate	Moderate	Moderate
626A:								
Kish----------------	---	---	---	---	---	High	High	Low
696A, 696B, 696C2, 696D2:								
Zurich------------	---	---	---	---	---	High	High	Moderate
697A, 697B:								
Wauconda------------	---	---	---	---	---	High	High	Moderate
698A, 698B:								
Grays---------------	---	---	---	---	---	High	High	Moderate

Table 25.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
706B, 706C:								
Boyer---------------	---	---	---	---	---	Moderate	Low	Moderate
791A, 791B, 791C2:								
Rush----------------	---	---	---	---	---	High	Moderate	High
792A, 792B:								
Bowes---------------	---	---	---	---	---	High	Moderate	Moderate
802B:								
Orthents, loamy-----	---	---	---	---	---	Moderate	Moderate	Moderate
805B:								
Orthents, clayey----	---	---	---	---	---	Moderate	High	Moderate
830.								
Landfills								
839B:								
Udipsamments, Typic	---	---	---	---	---	Low	Low	Moderate
Udipsamments, Aquic	---	---	---	---	---	Low	Low	Moderate
840B, 840C2:								
Zurich--------------	---	---	---	---	---	High	High	Moderate
Ozaukee-------------	Dense material	20-45	Noncemented	---	---	Moderate	High	Low
865.								
Pits, gravel								
969E2, 969F:								
Casco---------------	---	---	---	---	---	Moderate	Moderate	Moderate
Rodman--------------	---	---	---	---	---	Low	Low	Low
978A, 978B:								
Wauconda------------	---	---	---	---	---	High	High	Moderate
Beecher-------------	Dense material	24-45	Noncemented	---	---	High	High	High
979A, 979B:								
Grays---------------	---	---	---	---	---	High	High	Moderate
Markham-------------	Dense material	20-55	Noncemented	---	---	Moderate	High	Moderate
981A, 981B:								
Wauconda------------	---	---	---	---	---	High	High	Moderate
Frankfort-----------	Dense material	24-42	Noncemented	---	---	High	High	Moderate
982A, 982B:								
Aptakisic-----------	---	---	---	---	---	High	High	Moderate
Nappanee------------	Dense material	24-60	Noncemented	---	---	High	High	Moderate
983B:								
Zurich--------------	---	---	---	---	---	High	High	Moderate
Nappanee------------	Dense material	24-60	Noncemented	---	---	High	High	Moderate

Table 25.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness	Initial	Total		Uncoated steel	Concrete
		In		In	In			
984B:								
Barrington----------	---	---	---	---	---	High	Moderate	Moderate
Varna---------------	Dense material	24-60	Noncemented	---	---	Moderate	High	Moderate
989A, 989B:								
Mundelein-----------	---	---	---	---	---	High	High	Moderate
Elliott-------------	Dense material	20-45	Noncemented	---	---	Moderate	High	Moderate
1082A:								
Millington----------	---	---	---	---	---	High	High	Low
1103A:								
Houghton------------	---	---	---	6-18	55-60	High	High	Moderate
1107A:								
Sawmill-------------	---	---	---	---	---	High	High	Low
1210A:								
Lena----------------	---	---	---	5-15	50-90	High	High	Low
1330A:								
Peotone-------------	---	---	---	---	---	High	High	Moderate
1529A:								
Selmass-------------	---	---	---	---	---	High	High	Moderate
3107A:								
Sawmill-------------	---	---	---	---	---	High	High	Low
4103A:								
Houghton------------	---	---	---	6-18	55-60	High	High	Moderate
4777A:								
Adrian--------------	---	---	---	6-18	29-33	High	High	Moderate
8082A:								
Millington----------	---	---	---	---	---	High	High	Low